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General Article

THE INCIDENCE OF CANCER IN DOMESTIC ANIMALS*

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In dealing with a subject of this nature one can approach it in several ways. A statistical enquiry is of great importance but is apt to be rather dry; furthermore, no accurate statistics appear to have been attempted during recent years, especially in this country. One looks to the veterinary colleges to undertake research of this type, as usually a practitioner has neither the time nor the facilities to help in the collection of this information. For years I have kept records of every growth that was considered malignant after removal and have had the diagnosis confirmed by histological means. Unfortunately, those cases that have been destroyed without any attempt at treatment have not been included.

The aetiology of cancer is one of the problems of the day, but to the practitioner it is usually the clinical and surgical side that proves to be of the greatest interest. It is not a great number of years ago that the utmost confusion existed amongst medical men as regards the aetiology of cancer. It was believed that this complaint was confined to the human race and especially civilised communities. As diagnosis became more accurate the statistics showed a great increase in the number of cases. It was argued that the disease was one of civilisation and the alleged freedom of the lower animals was cited as a proof. We all know that all the lower animals suffer from cancer and one might say with assurance that this fell condition is extremely prevalent in the dog. In 1901 Bashford was appointed head of the Imperial Cancer Research Fund and he decided to place the study of cancer on a comparative and experimental basis. He made it one of his first objects to determine the incidence of cancer in the animal kingdom and to compare the fundamental features of the disease in man and animals.

In man cancer is not common unless one considers its incidence in relation to age. It is rare in young persons and early middle life, but it becomes increasingly frequent as age advances. Census returns analysed in connection with death certificates show that cancer has actually decreased. As no census of domestic animals is taken, excepting of horses and farm stock, and no death certificates are needed, the percentage of deaths from cancer is unknown, but a number of useful statistics have been prepared in abattoirs and veterinary colleges abroad which make interesting reading. Cancer in herbivorous animals is uncommon and cases amongst horses, cattle and sheep are comparatively rare. It is agreed, as far as cattle are concerned, that they are not allowed to reach the age when cancer makes its appearance. A large number of horses, particularly pedigree stock, reach a respectable, if dangerous, age, approximating middle and past middle age in man and yet one rarely meets with malignancy in these animals. Records seem to show that malignant growths of the lympho-sarcoma type are usually seen in quite young horses. Feldman[1] states that the explanation of the higher frequency of carcinoma in animals of advanced age may not be related to increased susceptibility of the organism to neoplasia on account of age itself. Certain biologic changes are ushered in with the advent of senescence that may exert a definite contributory influence on the inception of carcinomatous growths and these changes may originate in early life and only make rapid headway after senile changes make themselves felt. As early as 1902 Sticker[2] published a study, of a very comparative nature, of the incidence of cancer in domestic animals and he showed that the disease was by no means as rare as was supposed.

YEARS	2	4	6	8	10	12	14	16	18	20	
CASES.											Total Cases.
Dog	1	15	26	34	32	12	14	—	—	—	134
Horse	–	2	4	9	14	8	10	16	11	15	90

In 1902, also, Trotter—at the Glasgow Abattoir—reported that in that year, of 62,955 cattle killed, 27 carcases showed the presence of malignant growths, a proportion of 1 in 2,500. In 1904, 43,000 head of cattle were killed and 131 cases of cancer were found, and of these 116 were in aged cows from Ireland. In 1903, 63,000 head were killed and 21 cases were found, these again in aged cows from Ireland. Feldman[1] recently reported that in 40,000 horses killed he found 184 malignant growths, all of which occurred in old animals. Cohrs found in 737 dogs autopsied during two years, 56 malignant growths, distributed as follows:—

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Age.	No.	Carcinoma.	Sarcoma.	Multiple Tumours.
Under ten years	592	10	8	1
Over ten years	145	10	2	25

Generally speaking, the phenomenon of malignancy is known to affect the whole vertebrate kingdom. In whatever species it appears it presents features which are fundamentally the same—it originates *de novo* in each individual, it has a local origin, the tumour grows out of itself and does not transform the surrounding tissues that it infiltrates (Cranmer, W., 1932, Report Imp. Cancer R.F.[3]). The organic incidence of cancer in the domestic animals shows very interesting differences. The following data are compiled from Sticker's Monograph in 1902.[2]

	Horses.	Cattle.	Dog.	Cat.
Total Cases ...	332	78	766	21
Skin	22	1	166	6
Eye	14	2	8	6
Nose	52	2	1	0
Stomach	8	6	1	0
Intestine ...	5	1	0	0
Anus	8	0	89	1
Liver	3	4	20	2
Kidney	29	10	19	0
Bladder	14	9	9	0
Uterus	8	16	2	0
Ovary	4	6	3	1
Mammary Gland ...	8	1	341	5
Penis	52	2	16	1
Testis	13	1	18	0
Lung	13	3	10	3
Suprarenal	5	1	0	0
Thyroid	8	0	32	0

Several articles have been published from time to time by Sir John M'Fadyean dealing with the histological examination of growths sent to him for diagnosis. They cannot be called statistics, but they are nevertheless very interesting. In six years he studied 61 malignant growths which came from: horse, 31; dog, 23; bovine, 5; sheep, 2. He also published an article in the *J. Comp. Path. & Therap.*,[4] in which were tabulated some 49 cases of true carcinoma which he had examined; 25 of these were from the horse and of these seven were found in the penis, four in the antrum, four in the tail, three in the stomach and two in the bladder. From the cow five cases were examined; in the sheep, 1; in the dog, 16; and the cat, 2. This article was published when the horse was the all-important item in the work of the practitioner. In the horse the majority of recorded cases of malignant growths appear to come from the penis or bladder. Neoplasms of the upper and lower eyelids are seen, but they are not true cancer but a type of fibroma which, if not cleanly removed, tend to recur and become malignant. In a private communication received from Dr. Murray when head of the Imperial Cancer Research Fund, regarding one of these tumours sent to him by me for examination, he states: "The growth from the upper eyelid of the horse (recurrent) has the structure of a soft fibroma. As it has recurred and is slightly more cellular than usual, it probably belongs to that sort of fibroma which is apt to turn into a fibro-sarcoma. Cases have been described in man where, at each recurrence after the operation the growth is progressively more cellular, ending finally in typical sarcoma." Shortly after receiving this communication I removed one of these growths from the lower eyelid of a hunter. It recurred and was again removed, more boldly this time. Examination of the growth showed it to be a fibro-sarcoma. The question as to the malignancy of the small growth seen on the nictitating membranes of the horse has been several times discussed in the veterinary Press, and quite recently Mr. Lyle Stewart, in a letter to the *Veterinary Record* (**12**, p. 25), reports having examined one of these growths and proved it to be a carcinoma. Had the growth not been cleanly excised it would have invaded the surrounding tissues, both soft and hard, and would possibly have caused a fatal termination. Carcinomata of the liver, stomach and intestinal walls have been described on numerous occasions and as recently as December of 1931 Miles,[5] in the *Veterinary Record*, described an interesting case of carcinoma of the liver, stomach and omentum in a 14-year-old hunter, while C. P. Hynes,[6] in the *Veterinary Record* of December 15th, 1934, described an unusual case of carcinoma in a *four*-year-old blood mare. The growth affected the submaxillary space and was surgically removed. The tissue thus obtained was sent to a research institute, which reported that the growth was a fibro-lipoma. Healing did not take place and there was a considerable recurrence of the growth, which was again excised four months after the first operation. The growth was resubmitted for examination and the report this time was that it was a carcinoma. Lympho-sarcoma in the horse has been often described (Peele[7]).

In the bovine, most of our information has been supplied by those employed in abattoir work. Trotter, of Glasgow, has published from time to time many very interesting statistics. In one article he showed that, of 300 cattle killed with malignant growths, 298 were cows and two oxen. Of these growths, 279 were carcinoma and 26 sarcoma—four animals were affected with more than one tumour. (*See table next col.*)

Trotter[8] states that the preponderance of liver tumours may be due to the irritation set up by the presence of the liver fluke. It has

Position.	Cows. *Number.*	*Percentage.*
Liver ...	222	74 per cent.
Rumen ...	25	8·3 „
Thymus ...	16	5·3 „
Intestines ...	10	3·3 „
Lung ...	8	2·6 „
Ovary ...	5	1·6 „
Eye	4	1·3 „
Vulva... ...	3	1·0 „
Kidney ...	1	0·3 „
Uterus ...	1	0·3 „
Skin	1	0·3 „

been shown that rats fed on *Cysticercus fasciolaris* develop cancer of the liver to an alarming extent. Curtis and Bullock record the occurrence of 309 malignant tumours in 2,450 old rats in which growths in the liver had been induced by feeding with *C. fasciolaris*. In practice one seldom sees malignant growths in bovines. Most of those that are seen are confined to the membrana nictitans and subjacent tissues. Usually they have progressed so far that there is extensive necrosis of the soft and hard tissues around the eye when advice is called in. Carcinoma of the vagina is another favourite site, whilst carcinomata of the udder have on several occasions been described (C. Hynes,[6] *Vet. Rec.*, December 15th, 1934).

Why is it that cancer is apparently more common in the dog than any other animal? In the opinion of many this is due to the influence of diet. The dog is essentially a meat eater and the diet of the ordinary dog consists to a large extent of meat or by-products containing meat. Bell's theory is that cancer is a disease consequent upon a toxic condition of the blood; normal cell metabolism is weakened, and in an irritated or inflamed area, cell metamorphosis occurs, the result being a malignant growth. It is also suggested that the colon is the breeding ground for cancer; fermentation occurs here, toxins are absorbed, and these vitiate the blood. This happens especially on a meat diet and during chronic constipation. Bell compares cancer to a fungus and neither will grow on healthy tissue. In autointoxication lecithin will accumulate in minute but pathological quantities in the tissues. An injury or irritation will isolate from physiological control the cells at the seat of the injury. The lecithin will act as an irritant and produce metabolism, the result being a new growth. There is a lot to be said for Bell's theory, especially as cancer is comparatively uncommon in those races that are not meat eaters. Of the domestic animals carnivora are the most prone to cancer. To-day, I think I should be safe in saying that if one could get accurate statistics of the domestic animals affected, cases from the dog would preponderate. It may be that the dog is more thought of to-day than he used to be and this may be the reason why we get more neoplasms to treat.

In the dog one meets with cancer in practically every part of the body and of the various types of growths, carcinomata appear to be most commonly seen. This type is so widespread and its presence so disturbing that it must be considered the most important neoplasm affecting our animals. A carcinoma, I hardly need say, is made up of epithelial cells which proliferate in a lawless manner, exhibit a tendency to infiltrate and destroy surrounding tissues, and are likely to set up distant growths by metastasis. Feldman, out of 510 neoplasms studied, found 177 to be carcinoma. Fröhner, at the Berlin Veterinary School, reported carcinoma in 1,154 out of 60,471 dogs autopsied (1·9 per cent.). In the dog, Feldman found 28 out of 78 tumours to be carcinoma. Glioma of the brain occurs in dogs and descriptions of this growth have appeared in our veterinary Press from time to time (Dawes[9]). Osteomata of the bones of the head have been described and Virchow states that this condition not uncommonly affects the ethmoid and sphenoid bones. Epitheliomata of the gums are common and successful removal of these growths presents great difficulty. Often the bony tissues are invaded, causing much destruction and eventually enlargement of the affected area. When the growth is seen around the molar teeth with thickening of the bone it is difficult to say if the original site was the bone or the gum. Cancer of the fauces is common and again the condition is so far advanced when we see the case that very little can be done. The glands in the region of the parotid are common sites for carcinoma, whilst adeno-carcinomata of the thyroid and cervical glands are usually easily removed and do not tend to recur. Sarcomata of the under surface of the foot (interdigital space) are common and if not promptly removed a secondary soon forms in the popliteal gland. These growths are usually of the mast-celled variety. If boldly removed a good result may be expected, but if the smallest piece be left, recurrence will take place with great rapidity. Some of these mast-celled sarcomas are extremely malignant, but there are cell gradations down to practically benign growths. Malignant growths in children and young animals are usually sarcomatous in type. Sarcoma invading the back of the eye in children is often seen. In young animals up to twelve months old, growths are seen on the lips which, when removed, prove to be typical sarcomata. With clean removal there is not much likelihood of recurrence as they do not appear to be especially malignant in the first stages. Adeno-carcinomata of the mammary gland are common in the bitch, but the majority

of tumours seen in this position are not malignant. Neoplasms of the anal gland are mostly adeno-carcinomata. If not too large and not too widespread their removal may be attempted with every chance of success. Contagious venereal tumours used to be common in the dog. These tumours, which have been designated as infective granulomata, are a specific tumour formation and are transmitted by copulation. Intelligent propaganda by the veterinary profession amongst breeders has done much to reduce the incidence of this distressing complaint.

Neoplasms of the stomach and oesophagus are not so common in the dog as one would expect, especially as these constitute a common site for malignancy in man. Carcinoma of the liver is frequently met with, but growths in the pancreas and spleen are usually secondaries. Neoplasms in the testicles, unless removed promptly, invariably give rise to a secondary in the spleen. This I have seen on several occasions. Osteogenic sarcomata are quite common in the dog and are generally at the epiphyses of long bones like the femur, radius and ulna, etc. Carcinoma and sarcoma of the skin occur frequently in the dog and, strangely enough, dogs as young as three years old are affected. The small, black, wart-like growths seen on the skin in the region of the prepuce and abdomen are very often a very malignant type of melanotic sarcoma. Unless very cleanly and boldly excised they tend to recur with great rapidity. Lympho-sarcomata are all too frequent and often invade all the internal lymphatic glands and organs. Obscure nodular swellings in the skin of the neck and thoracic region should be considered possible lympho-sarcomata. Bilateral enlargement is especially significant of lympho-sarcoma. A history of fatigue and evidence of digestive disturbance are suggestive of this disease. The data given below consist of one year's reports (March, 1935-March, 1936) received from the Imperial Cancer Research Fund on growths submitted to them for examination and only represent a fraction of the cases seen; for in those cases where the owner did not desire surgical interference but preferred to put the animal to sleep, no material was taken for examination.

Animal.	Age.	Position.	Histology.
Pekingese. M.	8	Anal region	Carcinoma of sebaceous gland
Bull terrier M.	4	Thyroid gland	Carcinoma
Alsatian. F.	10	Mammary gland	Squamous - celled carcinoma
Retriever. F.	5	Liver and omentum	Round-celled sarcoma
Fox terrier. M.	8	Pectoral region	Alveolar carcinoma
Skye terrier. M.	7	Interdigital space	Melanotic sarcoma
X-bred terrier. M.	11	Testicle	Carcinoma
Cat. M.	12	Brain	Spindle and multinuclear giant-celled sarcoma
Airedale. M.	5	Popliteal gland	Sarcoma (secondary to one taken from foot)
Cat. M.	7	Lower lip	Spindle-celled sarcoma
Airedale. M.	10	Testicle	Sarcoma
Fox terrier. F.	10	Mammary gland	Carcinoma
Labrador. M.	9	Thyroid	Carcinoma
Setter. F.	3	Lower mandible and gum	Epithelioma
Greyhound. M.	3	Shoulder	Mast-celled sarcoma
Fox terrier. M.	10	Popliteal region	Endothelioma
Fox terrier. M.	15	Skin over abdomen	Epithelioma
Airedale. M.	9	Interdigital space	Malignant adeno-epithelioma
Staffs. Bull terrier. M.	3	Skin over elbow	Squamous - celled carcinoma
Airedale. M.	3	Pleura	Sarcoma (4 lbs.)
Aberdeen. M.	9	Liver and mesenteric glands	Carcinoma
Spaniel. M.	10	Lower gum and mandibular space	Basal-celled carcinoma

Summary: Males 18; Females 4. Carcinoma 10; sarcoma 8; epithelioma, 3.

References:

[1]Feldman, "Neoplasms of Domestic Glands."
[2]Sticker, "Monograph on Cancer."
[3]Reports of the Imperial Cancer Research Fund.
[4]M'Fadyean, Sir J., *J. Comp. Path and Therap.*
[5]Miles (1935.) *Vet. Rec.* 11. 1278.
[6]Hynes (*Vet. Rec.*), December 15th, 1934.
[7]Peele (*Vet. Rec.*), May 5th, 1935.
[8]Trotter, *J. Comp. Path. and Therap*, 1911. 4.
[9]Dawes (1935.) *Vet. Rec.* 10. 31.
[10]Amoroso, E. C. *Vet. J.* (1935.) p. 80.
[11]Barrett (*Vet. Rec.*) p. 1073, 1934.
[12]Boddie (*Vet. Rec.*) April 3rd, 1931.
[13]Mason, J. H., "Cancer—A Résumé and Causative Theories, Incidence and Treatment."
[14]Davies, H. L. (*Vet. Rec.*) June 22nd, 1935.
[15]Hutyra and Marek, "Special Pathology."
[16]Nicholson, "Structure of Formation of Tumours."
[17]Stewart, Lyle (1935.) *Vet. Rec.* 12, p. 25.
[18]Wheatley, *Vet. Med.* (Chicago) 1935, p. 258.
[19]Wright, T. L. (*Vet. Rec.*) November 23rd, 1935.
[20]Cocker, W. J. *Cornell Vet.* (1919.) p. 142.

Discussion

The discussion of the foregoing paper was opened by Dr. E. C. Amoroso, Lecturer in Histology at the Royal Veterinary College.

Dr. Amoroso said: I must confess that I regard it as a singular honour to be asked to come here

this evening to open a discussion on the question of the incidence of cancer. I do this with much trepidation, because I feel that it is a matter of "fools rushing in where angels fear to tread."

The question of the incidence of cancer should not be considered unless one bears in mind the possible relationship which may exist between chronic inflammatory conditions and malignant conditions. Inflammation ends with repair. Repair consists essentially of proliferation of tissue elements: so too, does the neoplastic condition. Can one, then, definitely say where the proliferation of repair ends and where the proliferation of neoplasms begins? This question is not easy to answer, because it is quite possible that the hyperplasia of chronic inflammatory conditions may cross the border line and become the hyperplasia of neoplastic conditions.

This aspect of the subject has an important bearing on the condition known as Hodgkin's disease and renders of particular interest the cases of Hodgkin's disease in the dog referred to by Major Chambers. The so-called Hodgkin's disease of the dog, described somewhat fully in this country, is not the disease medical workers recognise as affecting human subjects. The latter partakes of the character of both neoplasia and chronic inflammation and is regarded by some as a true lymphoblastoma, by others as a tissue reaction to a chronic infection. The possibility that there is a myeloid metaplasia of the lymphadenoid tissue, as a result of which cells of the myeloid series may be produced locally in the lymph nodes, must not be excluded. When, therefore, we are discussing the incidence of tumours, it is clear that there may be border-line cases which can be grouped only with the greatest difficulty.

There are other fundamental questions to be answered with regard to the incidence and susceptibility of individual species of neoplasms. I shall try to deal with a few of them. What parts do irritation and susceptibility play in the production of new growths? Major Chambers mentioned the cases of Bullock and Curtis, in which the cystic stage of the cat tapeworm (*Cysticercus fasciolaris*) was used as the agent of irritation in the production of tumours in rats. In the particular cases cited the primary tumours were sarcoma of the liver and the tumours occurred more frequently in certain strains than in others. Now when we recall the relative infrequency of sarcoma of the liver in the cat (as reported in the literature), the conclusion may be invited that individual susceptibility in the rats, and organ susceptibility in the liver, as well as the chronic irritation, influenced the mesoblastic tissue to undergo neoplastic transformation. How much is due to susceptibility and how much to irritation it is difficult to say. While general and organ susceptibility may be important factors in accounting for the incidence of malignant tumours, they cannot, for obvious reasons, be pressed too vigorously into service to provide statistical data for determining the frequency with which animals are affected with new growths.

Fibiger (1907), when working on tuberculosis, found a nematode worm in the carcinoma of the stomach of a rat, and he attempted to reproduce the condition by feeding rats with the parasites, which he subsequently designated *Spiroptera neoplastica*. It was six years before he discovered that simple irritation by the parasite was not sufficient and that the only means at his disposal to produce a cancerous condition comparable to the neoplasm he accidentally found, was by actually feeding the rats with the cockroach which was the intermediate host of the worm. Fibiger believed that the substance producing the neoplastic change was a poisonous secretion from the nematode. The work of Fibiger and Bullock and Curtis is instructive, I think, in showing the variable character of the irritative substance that may induce malignant changes.

Many other irritant substances have been used with success. Among these may be mentioned certain carcinogenic tars, which when painted on the skin of certain animals for a length of time produce a tar cancer. Now the addition of a minute quantity of mustard gas to a carcinogenic tar almost completely inhibits the action. This is not due to inactivation of the tar, but to a local action of the mustard gas on the skin preventing it from reacting to the carcinogenic tar. Further, a second tarring will not induce the change in an animal which has already developed a tar cancer, nor can a tar cancer be induced in an animal with a spontaneous carcinoma; but an animal with a transplanted tumour can be successfully inoculated with a tar cancer, and a tumour can be transplanted into an animal with a tar cancer. Not all tars will produce the change, nor are all animals suitable. The correct tar and the right animal must be used. The meaning of all this is not clear.

Another important feature in the experimental production of tumours is the probable immunologic significance of the lymphocyte. Murphy and Morton found that a resistant state accompanied by marked lymphocytosis was induced in mice which had been injected with defibrinated blood, but destruction of the lymphoid tissue by exposure to Röntgen rays abolishes the immunity. Tumours can only be transplanted to animals of the same species, but the difficulty can be overcome if the transplant is made into the brain. The absence of lymphoid tissue in the brain is the probable explanation, for the addition of a piece of the animal's own spleen renders the brain also immune.

Some of the cases reported by Major Chambers are of interest to me, particularly because, through the generosity and the courtesy both of the Principal of the Royal Veterinary College and

Dr. McCunn, I had the opportunity of studying the effect of colchicine on these tumours. The clinical aspect of these cases I shall leave to Dr. McCunn to describe to you. I shall deal with the experimental side.

It was my good fortune to have noted in 1927 the beneficial effects of deep X-ray therapy on neoplasms in patients suffering from acute gout who had been treated with colchicine. I then conducted a series of experiments in conjunction with Dr. J. M. Findlay, of the Wellcome Bureau of Scientific Research. The tumours we used were the mouse carcinoma (M63) and the mouse carcinoma (M206). A week or so after the tumours were transplanted colchicine was administered to the mice as illustrated on the charts (exhibited). I would ask you to notice the gradual tailing off in size of the tumours after three weeks. The next chart shows the actual size of the control tumour at the end of this time.

The action of colchicine in arresting the growth of these experimental tumours is at present little understood.

I am inclined to believe that colchicine stimulates karyokinesis and that once the cells are brought to the metaphase they are killed by the toxic action of the drug. It has long been known that colchicine excites mitotic division, and that it becomes changed to oxydicolchicine both by the slow action of air and light and by nascent oxygen. This oxidation occurs normally in the living body. It would seem, then, that the cells are brought to metaphase by the initial action of the drug and that later a more insidious and toxic action is developed, leading to the destruction of the cells that are in metaphase (*i.e.*, those cells in which the metabolism is most intense and whose stability is least, this late effect being due to the oxydicolchicine formed normally in the living body.

[Dr. Amoroso now proceeded to show a number of lantern slides, with the introductory observation that these were intended to illustrate some of the types of cases upon which they had been using colchicine.]

Dr. McCunn said that he had listened with great interest to Major Chambers that night, and much of what the essayist had said bore out his own observations. There was one observation, however, that he thought he should make, and that was this: that these malignant growths in dogs were not nearly so malignant from the point of view of metastasis as those of people. About 1924 or 1925, when he was a budding medical pathologist during the day and making a living as a veterinary surgeon at night, he used to take sections of those tumours which he removed from dogs to the laboratory. He did not examine them himself: he got a very able pathologist to do so—Dr. William Woods, who was probably the second ablest morbid anatomist in this country. Much to his surprise, many of these tumours turned out to be, according to Dr. Woods's description, based on his human experience, of a highly malignant nature. He followed the course of many of those dogs and on very few occasions did recurrence take place. They came to the conclusion that although these tumours, judged from the human point of view, were highly malignant, the same teaching did not follow in the dog. All the way through since those years he had noted that there were certain types of tumours in certain regions, which always did recur, particularly those found in the region of the hip and even more especially in the frontal region, while in the inguinal region even the smallest of tumours he treated with the utmost respect.

Venereal tumours of the dog, particularly of the bull dog, were very remarkable tumours, because if one was bold with these tumours they did not recur, although they knew, by their mode of transmission, that they were highly infective.

Coming to the alimentary tract, it was strange that they did not often get tumours of the stomach, the duodenum, or even of the large intestine; he had seen very few in these positions. He remembered one tumour, a scirrhous carcinoma of the small intestine, which was subjected to examination by a most able pathologist and the latter was unable to find any secondaries, though by the appearance of the tumour it had been there for a long time.

Concerning the pancreas as the site of tumour in the dog, he had met with one or two in that situation. He had a remarkable case about six weeks previously—a dog sent up to the College by Mr. Carless of Bicester. This was one of those so-called "praying" dogs: it would get down on its fore legs, stretch itself and stop in that position for a quarter of an hour. Palpation and all other clinical examinations revealed nothing definite. They knew that the dog had difficulty in emptying his stomach, for after a meal one could feel food in its stomach for more than the usual four to six hours which they knew was the time taken for the dog to empty its stomach completely. The dog was X-rayed and, by means of a barium meal, they found that its stomach did not empty under six hours, but the most striking thing revealed by that X-ray was the fact that the pyloric end of the stomach, which was well shown by the barium meal, instead of turning forwards turned backwards and abruptly stopped, and it was thought that there was probably some obstruction of the pylorus. He opened the dog and found that the animal had a tumour of the pancreas, which was identified as carcinoma.

Growths in the testicle of the dog were very common and frequently they occurred in old dogs, but in no case of malignant growth in the testicle had he ever seen a dog that showed recurrence at the site; on the other hand, however, they always showed metastases in the iliac glands.

Osteosarcoma or periosteosarcoma of dogs was another remarkable tumour. If a large dog came to him with a lump at the end of one of its long bones, and with a history as follows—that its owner took it for a walk, it went suddenly lame and by the time it got home it was sound, but since that date he had noticed a lump—he thought it was always 100 to 1 chance that that dog had got an osteosarcoma.

Growths in the cat were, in his experience, rather uncommon.

So much for the general statement. Now he wished to come to his friend, Dr. Amoroso's colchicine treatment. Dr. Amoroso had told him that the effect of colchicine at first struck him after the treatment of an Irish priest, and again after treating a second Irishman with deep X-ray therapy for, in both cases, malignant tumour of bone. If it had been left at that point he did

not know whether the credit should have gone to colchicine or really to Irish whiskey, because he had no doubt that these poor fellows, knowing the seriousness of the condition, had had recourse to forgetfulness in whiskey. However that might be, fortunately Dr. Amoroso went on, and they knew that in his experimental animals with his transplanted tumours he had had almost 100 per cent. success. They arranged to try it on dogs and horses. The first case he got was a Sealyham, aged about seven years, which was brought to the College because it could not bark and it had difficulty in swallowing. The right tonsil was found to be greatly enlarged. It was the size of a large walnut and had a cauliflower-like surface. Eventually it was diagnosed as a malignant growth, and in the ordinary course of events they would have destroyed the dog. Knowing of Dr. Amoroso's colchicine treatment they offered to treat that dog at the College expense, if the owner would not mind the experiment taking place. Dr. Amoroso supplied the material—he believed it was one-fortieth of a milligramme per dose—and Dr. Amoroso's instructions were to give a dose subcutaneously every second day. After about the third injection he was acquainted with the fact that the dog was beginning to bark, but he did not take much notice of that and they went on with another two injections; then he himself heard the dog bark. The dog was rather an awkward one to handle, so its throat was not examined every day. The improvement appeared to be so remarkable that they gave the dog some morphia and examined the throat. Much to his surprise, he could see that the lump was disappearing. He was still sceptical and he said to Dr. Amoroso, "I will not believe this; we must take a portion of this growth to section." He (the speaker) refused to take the whole lump as he wished to put the colchicine to the test. Accordingly, he took a wedged-shape portion away, of which they had the histological picture before them at that meeting. Treatment lasted six weeks and the dog went away from the College apparently completely cured, with no sign of recurrence. (Applause.)

The next case—an even more remarkable one—was a Scottie dog which a man brought to the speaker's private house one night. This man had heard that he had the parochial title of Professor and thought that he could do something for his dog. This dog had a large growth, on his near hock, which looked to him to be of a malignant nature: it was offensive and in a deplorable state. The anxiety of the man and his wife concerning their dog moved him to compassion, and he told them that if they brought the dog to the College they would try the new treatment; surgery alone would have been useless. He removed a small portion of this tumour and it proved to be a squamous-celled carcinoma. They applied the colchicine treatment and the way that tumour disappeared, with no other treatment, was remarkable. In three weeks that dog had left the College with the skin on its hock just showing a scar, and even the scarred skin was movable over the deeper tissues.

The subject of the next case was a hunter; a horse which had competed at Olympia with credit. It had a lump on its off-side upper maxilla. They thought that that lump might be an osteosarcoma or that it might have something to do with the teeth. They put the horse down and chloroformed it, and after a full examination he came to the conclusion that it was a malignant growth. He asked Dr. Amoroso to look at it to see if he thought that that colchicine treatment would have any effect. Dr. Amoroso was non-committal, but resolved to try. A portion of the growth was taken for section, and the horse was put on one-fiftieth of a milligramme subcutaneously every second day. He had pronounced local reaction at times at the site of injection, but the tumour began to wilt away and all that was left to-day at the site was a thickened ridge on the alveolar border of the jaw. He considered that horse, again, a cure.

Another case that came his way was a dandie dimont, which had some difficulty in passing its faeces; in fact, it could only pass them in a ribbon shape, as was seen when squeezing a tube of toothpaste. The dog, owing to his colon being continually filled up, suffered from a certain amount of toxaemia; it did not eat well, was poor and in a miserable state. Its rectum was very sensitive and, in the roof of the rectum—not involving the mucous membrane, but outside the mucous membrane—was a tumour as long as the first finger and as wide as two fingers. They were unable to get any of that tumour, because of its site, for histological examination, but the dog was put on a course of colchicine; it had a fortieth of a milligramme every second day and, much to his surprise, this tumour began to get smaller and it was not long before the dog was passing normal faeces. At the eighth week it left the College quite a fit dog, the tumour by this time having been reduced to one about half the length of the digital finger and about half as wide. That treatment took place at the beginning of last summer and the dog kept perfectly well until about ten days or a fortnight ago, when he began to show a little irritation behind and they found that that tumour had come back to some extent. It was intended that the dog should be put on colchicine again, but this time he hoped that, with the aid of the veterinary surgeon at home, they might be able to continue it for a longer period.

He thought that Dr. Amoroso's colchicine treatment, although it was not an infallible cure for malignant growths—as Dr. Amoroso himself had pointed out, it was not of service in such a condition as periosteal sarcoma—was one of the things which held out tremendous hopes for the future, and he was going to continue using it, because if it would only resolve or cure 25 per cent. of malignant growths it would be one of the biggest boons that this world could know. That colchicine also acted by local application and Dr. Amoroso had evolved a concentrated colchicine; they had applied that concentrated colchicine to some of those growths, and upon those growths which had a raw surface it seemed to act in certain cases like a charm.

A short time ago he operated on Leo, the champion bloodhound, which had an enormous melanotic tumour on the near hind foot. If he had been an ordinary dog he should not have operated upon him, but the owner insisted. He removed as much of the tumour as possible but of necessity some of the pigmented stuff was left behind. Fortunately, the owner was a professional person—a dentist—and they were able to give her some colchicine to treat the dog herself; in her own words, the progress made was remarkable. It was healed in three weeks. He had seen the dog since and one would never have known that such a malignant growth had ever been there.

It only remained for him to thank Maior Chambers and Dr. Amoroso—in particular, Dr. Amoroso for his investigations and discoveries concerning colchicine.

Dr. Tom Hare said that what little he had to contribute was academic, but he would like to congratulate Major Chambers on making such a

careful study of his material. It was unfortunate that the further expenses involved did not always permit the general practitioner to have his cases of neoplasia examined histologically.

He thought the main concerns of the practitioner were (1) was the tumour removable without destroying the animal, and (2) was the tumour likely to be associated with deep-seated or inoperable metastases? What the pathologist had to say about tumours was of less interest to practical men. He did not want to involve himself in a debate with Dr. Amoroso, although he did not accept a great deal of what the latter had said. Dr. Amoroso, he must nevertheless observe, persistently used the term "metaplasia," but he (Dr. Hare) had always been under the impression that the process of metaplasia was not synonymous with the process of neoplasia.

The colchicine experiments were very interesting and he hoped that Dr. Amoroso and Dr. McCunn would be able to secure clinical successes with it. Dr. Amoroso had mentioned Hodgkin's disease as being a malignant growth. He thought that Dr. Amoroso had adopted this mistake from some American authors. The so-called Hodgkin's disease of the dog had been accurately defined in this country for some years as leukaemia; it was not a neoplastic condition at all, it was a disease of unknown origin of the blood or haemopoietic system.

He understood Major Chambers to say that glioma of the brain was not uncommon. He (Dr. Hare) could only recall one case which Mr. Howard Dawes described in the *Veterinary Record*, (1930), **10**, 717. Mr. Dawes had sent him the material for diagnosis and he was under the impression that it was the first case recorded of that particular type of tumour. He believed, from the literature, that glioma in the dog must be extremely rare. In the human being, however, glioma was more frequently met with, and then it was usually a rapidly infiltrating sarcomatous type of tumour of the brain. Mr. Dawes's case was of particular interest to him (Dr. Hare) as a pathologist because it was a slow-growing type arising just beneath the ependyma.

Another point Major Chambers raised was about carcinoma of the testes with secondaries in the spleen. Did Major Chambers have those secondaries histologically examined? Because metastases in the spleen of the dog must be exceedingly rare. "Lumps" in the spleen of the dog, on the other hand, were quite common, and one had to be careful when making a *post-mortem*, accurately to determine their nature. The dog's spleen was very prone to haemorrhage; any shock to the dog's blood pressure was reflected in its spleen by haemorrhages, which led to those tiny opaque nodules with which they were all familiar; these haemorrhages might sometimes be of the size of a Jaffa orange. Mr. Norman Male recently, in the *Veterinary Record*, described a case in a dog of such a large haemorrhage into the spleen. Some of his old students there would recollect the considerable number of dog post-mortems showing those nodules of the spleen which were the result of haemorrhage and were true examples of metaplasia, not neoplasia.

Thyroid carcinoma of the dog was one of the well known types of neoplasia in that animal; he was under the impression that it was not one of the common forms of enlargement of the thyroid. If the surgeon removed an enlarged thyroid, it would be as well to get a histological diagnosis, because, probably, in the majority of cases, it was a goitre; less commonly it might be a simple adenoma, or thirdly, it might be carcinoma. If it proved to be a carcinoma, the probability of metastasis into the vascular system should be borne in mind. Thyroid carcinoma tended to metastasise into (1) the root of the lung; and (2) the endocardium of the heart. That at once made the clinician anxious in regard to his prognosis. He might think he had effected a perfectly clear removal of the malignant growth, but he would advise him to give a guarded prognosis because of that tendency for the malignant growths of the dog's thyroid to metastasise into the heart or into the lung.

With regard to mammary tumours of the bitch, he was hoping that Major Chambers was going to talk about them a little more fully. While the majority of mammary tumours of the bitch and of the dog clinically were not malignant, histologically one frequently found malignant change taking place inside them, although these tumours showed no signs of infiltrating the deeper tissues. There again, there was always an element of hesitation about these cases, because in sections, taken from different parts of the tumour, occasionally there was found the beginning of a malignant change. The clinically benign tumours were in sharp contrast to the actively growing carcinomata of the mammary gland of the bitch which, he thought, were more common —certainly from his *post-mortem* statistics—than Major Chambers had suggested by his figures. Those tumours had not infrequently been diagnosed as acute mastitis because the mammary gland enlarged quickly and there was a discharge from the teat. This was due to the fact that the malignant growth starting just inside the duct obstructed the duct and the obstructed gland became secondarily infected, so that the clinical picture was more of a mastitis than of a neoplasm, *i.e., the* mastitis masked the neoplasm. Those, however, were the cases which usually infiltrated deeply and metastasised.

There was a type of carcinoma in horses which was frequently overlooked until it became inoperable, and that was the carcinoma arising in the sinuses of the skull. These carcinomas in the early stage usually were associated with sinusitis, which masked the clinical picture, and thus the malignant growth might be overlooked. He was wondering if anyone had investigated the diagnosis of such growths from the radiological point of view.

Major G. E. Oxspring said that he had only one remark to make, and that was to try to answer Dr. Hare's question. Periodically they did meet with those cases of squamous-celled carcinoma in the facial sinuses of horses and they had recently recorded two cases in *The Journal R.A.V.C.*, where the carcinoma had penetrated from a facial sinus into the orbit. He had also seen quite a number of ozœna cases in which, on *post-mortem* examination, he had found cancer of the carcinoma type. He would not say that this condition was common, but possibly one or two cases in a year occurred in Army horses.

Captain R. J. Stow, having expressed his thanks to Major Chambers for the interesting contribution he had made that evening, said that he had there a specimen which was brought to the meeting by Mr. Addis, who unfortunately had had to go. It was a specimen of osteosarcoma from the radius of a twelve-year-old sheepdog. Mr. Addis had told him that the lump was as large as a cricket ball and the ulna also was slightly affected. The dog had been lame for three weeks before it was destroyed.

Miss O. Uvarov asked Major Chambers if, in the large number of cases of mammary tumour in the bitch with which he had met, *post-mortem*

examination had ever revealed any involvement of the liver—because in a number of recorded cases it had been said that in the majority of such bitches the liver had been involved.

The President (Captain J. F. Macdonald) observed that he was sure they were all very much indebted to Major Chambers for travelling such a long way to give them that excellent paper. (Hear, hear.) He supposed it must be thirty odd years ago since Major Chambers and he indulged in some of the more robust delights of the dissecting room at the Royal Veterinary College; Major Chambers, he remembered, was a brilliant student there and his subsequent career had, he thought, been equally brilliant. (Applause.)

The only question he desired to ask him was with reference to his operations; did he take the lymphatics out as well? It was not of such importance in our patients, but in the human operation the amount of lymphatics taken away was very considerable.

With regard to Dr. Amoroso's treatment with colchicine, he had only seen one cancered animal so treated; it was not successful, because the tumour happened to be one of the bone type, but there seemed to be a curious effect on the dog's kidney—after the injection of the drug there always appeared to be a certain amount of haematuria and a good deal of discomfort. He wondered whether, in the experience of others, that was a noticeable feature of this treatment.

Dr. McCunn asked Major Chambers if, in his inguinal tumours—which he (the speaker) never liked—he had ever found them to have any association with actinomycosis in the dog. He met with one case three years ago, in conjunction with Major Dalling and Mr. Cornish Bowden, and he had heard of one other case. Ever since then he had been looking for further cases. He believed that No. 1 case was the second known case of actinomycosis in the dog.

The Replies

Major Chambers thanked the Fellows very much for the way in which they had received his paper and added: "As for Dr. Amoroso, I think he ought to have read the paper and I should have opened the discussion." (Laughter.)

Proceeding, Major Chambers said that he did not know whether Dr. Amoroso (who had arrived late at the meeting) was there when he was discussing the question of fibroma of the eye of the horse becoming malignant, because that point was rather interesting after what Dr. Amoroso had said about papilloma of the rectum of man becoming malignant. Fibromata of the eye of the horse definitely became more and more malignant and might even finish up as fibrosarcomata. Dr. McCunn had enquired if he had ever observed any association between the melanotic sarcoma of the inguinal region in dogs, which was so very malignant, and actinomycosis. He (the speaker) had never seen such a case which, to his knowledge, had been of an actinomycotic nature, but there was no reason why actinomycosis should not get mixed up with the growth, although he had never looked for the fungus. That reminded him about actinomycosis of the mammary gland in the cow: he had never seen one case of actinomycosis of the udder, and why this should be one of the conditions for which the cow's udder had to be examined under the Grade A Order, he did not know, he should think that it was extremely rare in the cow.

The use of colchicine in the treatment of cancer was, of course, of the utmost interest to them all. He had only used it on one case and it was a failure on that occasion, but it might not have been a suitable case. The subject was a young three-year-old golden retriever suffering from carcinoma of the gum which included all the lower mandible. They found that the first three or four injections did the dog good: the owner reported that he was much brighter and that there was not so much pain on eating. It might have been a case of fibrosarcoma that affected the other tissues. When he saw another case of tumour of the fauces, or on the hock, he was certainly going to try the colchicine treatment. It would be interesting to know if colchicine had any prophylactic action. His father was a great sufferer from gout and took a great deal of colchicine, but although he was 85 years of age and had been taking the drug for a long time, he had shown no signs of malignancy.

Another very interesting observation made by Professor McCunn was his statement that growths in the animal world were not so malignant as in man—it might be that the lymphatic system was not so well developed in animals as in man, or it might be that animal surgery was better. (Laughter.) [Dr. McCunn: "I think it may be that in the mammary tumour we are very very bold, whereas in human surgery they do a tremendous amount of teasing dissection."]

Continuing, Major Chambers said that it was his experience that osteosarcoma of the long bones nearly always occurred in the large breeds of dogs, such as great Danes, mastiffs, St. Bernards, and Irish wolfhounds. There must be some reason for that and that reason might be associated with the fact that these tumours came up so very quickly.

In passing, he noticed that the dose of colchicine given to a horse (at least, the horse upon which they had heard the report that evening) was smaller than that given to the dogs, *viz.*, one-fiftieth milligramme as compared to one-fortieth milligramme. What was the reason for that?

[Dr. Amoroso: "For some inexplicable reason—or, at least, a reason as yet unexplained—large animals seem to react more readily to colchicine."]

Replying to Dr. Hare, Major Chambers observed that he agreed that what people called Hodgkin's disease, although it was a true leukaemia, was not a neoplastic disease. Glioma, he considered, was not common; he had only seen four cases in the dog in the past sixteen years, and one case in the cat—one could hardly call that common.

Dr. Hare had raised rather an interesting point concerning the occurrence of secondary growths in the spleen: it was a moot point whether it was the growth in the testicle that was primary and that in the spleen secondary, or *vice versa*. In the last few years he had had sectioned two cases of splenic tumour and the findings in both cases agreed with the original diagnosis made from tumour of the testicle. It might be that the tumours arose in the spleen first and were not noticed, and neoplasms of the spleen were of interest, because he had often wondered, on making a *post-mortem* examination, how it was that one hardly ever saw a dog's spleen that had not got a lump on it. In one case the dog was run over three months previously, and when they examined him *post-mortem* they found a lump on his spleen as big as a coconut.

Concerning tumours of the mammary gland, he had not seen a great number of the malignant type, but in the monograph he had mentioned in his paper, out of 760 cases of malignant growth,

371 were of the mammary gland. If one did get a real carcinoma of the mammary gland, unless one was very bold in operating there was nearly always a recurrence.

The President had asked him if he ever took out the lymphatics: he did not think that they could be seen in the mammary gland of the bitch. He knew that in the human subject they did remove them, but he did not see how one could see them in the bitch. If they got well round the growth and took a margin of clean tissue away, they would stand a better chance of success.

In reference to Dr. Hare's enquiry as to the occurrence of squamous-celled carcinomata arising from the sinuses of the head in the horse—comment upon which had also been made by Major Oxspring—during the War he hardly ever saw a case of cancer of the maxillary sinus, but since the war he had seen quite a number of them. Probably in the War the horses were all young—about five years old—and that would render it exceedingly unlikely that war-time Army experience would yield many cases.

In reply to Miss Uvarov's enquiry concerning mammary cases, he could not say that he had ever noticed liver degeneration because if one made a *post-mortem* of a case of mammary tumour that had recurred, one would take a casual glance at the liver and if there were no secondaries in it one probably would not examine it any further.

Dr. Amoroso, in the course of a brief reply to the points in the discussion addressed specifically to him, said that perhaps he should correct what was an erroneous statement made by Dr. Hare with regard to Hodgkin's disease. What he did say was that the condition termed Hodgkin's disease in the dog was not the Hodgkin's disease of the human subject. Human Hodgkin's partook of the character of both inflammation and neoplasia and it was extremely difficult to state whether it should be classed with the granulomata or the lymphoblastomas.

As to the confusion of metaplasia and neoplasia, he must confess to being perfectly cognisant of the essential differences between metaplasia and neoplasia. (Laughter.)

In reply to the question why the dose of colchicine given to the horse should be smaller than that administered to the dog, Dr. Amoroso said that the only reason for giving the smaller dose what that the horse reacted so violently to the initial larger doses that it was decided to administer the smaller ones. If the horse showed no violent reaction, then the larger dose was persisted in.

The British Film Institute, 4, Great Russell Street, London, W.C.1., has now issued a catalogue of the medical films available in this country. It is not thought to be by any means complete—for instance, there are only two films of a veterinary nature listed and consequently, the Institute will welcome information pertaining to films not already mentioned in order that they may be included in supplements that are to be issued from time to time.

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The Duke and Duchess of Gloucester have sent a donation to the Beaumont Small-Animal Clinic (poor people's department) of the Royal Veterinary College from the proceeds of the public exhibition of their wedding presents. The Duke of Gloucester is the President of the College.

The Veterinary Record

May 30th, 1936.

MILK (SPECIAL DESIGNATIONS) ORDER, 1936

THIS new Order, the principal features of which were published in our issue of May 2nd, and which comes into operation on Monday, marks an important milestone in milk legislation, involving as it does a change over from Ministry to Local Government control. It remains to be seen whether or not this is a change for the better.

During the last 13 years the Ministry of Health has retained the control of the two higher grades of milk and delegated its authority in relation to Grade "A" milk to the County Councils. By this means there was established a uniform standard throughout the country for Certified and Grade "A" (T.T.) milk, whereas the conditions for production of Grade "A" milk varied in almost every county. With the advent of the Accredited Herds Scheme the discrepancy and lack of uniformity and co-operation between the counties became more obvious, some counties being perhaps too strict and some too lax, and the result has been the creation of a chaotic situation.

In some counties the whole-time veterinary staffs have been responsible for the inspection of buildings, and in others the sanitary inspectors. There are counties in which any farmer could get a licence providing he could produce a certificate showing a clean bill of health for his cows and a low bacterial count for the milk; in other counties producers have been required practically to rebuild their cow sheds. This lack of uniformity is extended to the measure of help given to the farmer. In some counties a free veterinary service has been supplied either through local whole-time veterinary officers, part-time veterinary officers, or the general practitioners; in other counties, the inspection has been semi-free while in yet others the producer is required to pay for all four quarterly inspections. Some localities have even supplied a county service organised on a basis yielding a profit to the local authorities.

We earnestly hope that the local authorities will face their new responsibilities under the Milk (Special Designations) Order, 1936, in a business-like manner, and endeavour in the

interests of both producers and consumers of milk to arrive at some uniform standards.

With regard to the veterinary inspection of herds under the new Order, we would once again draw the attention of the County Councils to the agreed Scheme of the National Veterinary Medical Association and the views which it placed before the Ministry of Health with the object of ensuring the best possible scientific and administrative efficiency and co-ordination of the services of the profession. It will be remembered that the Association recommended that in every county, according to its size and the number of its cattle population, one or more whole-time veterinary officers should be appointed to direct and co-ordinate the work of the practitioners; that the tuberculin testing and clinical examination of "Tuberculin Tested" herds and the clinical examination of "Accredited" herds should remain, subject to collaboration with whole-time staffs, in the hands of veterinary practitioners, and lastly, that the Ministry of Health should issue definite instructions to local authorities in order to ensure uniformity of administration and of conditions of production.

If local authorities will favourably consider these recommendations they can be assured of the whole-hearted co-operation and support of the veterinary profession without which support the Milk (Special Designations) Order, 1936, cannot be efficiently administered.

We welcome the simplification of the nomenclature. "Tuberculin Tested" now embraces the old "Certified" and Grade "A" (T.T.) designations, though the word "Certified" may be added if the milk is bottled on the farm. Pasteurising of "Tuberculin Tested" milk is now permitted and when carried out must be so described. The designation "Accredited" is an improvement on the old "Grade A" and is applied to raw milk produced from cows which have passed a veterinary examination under conditions similar to those before existing under the 1923 Order.

The third grade, "Pasteurised," is applied both where "Accredited" milk and where other milk is pasteurised in accordance with the requirements of the Order. The conditions are substantially the same as in the Order of 1923.

It is noted with gratification that the Ministry of Health has adopted in the new Order several suggestions put forward by the Association, such as those referring to the conditions of entry of fresh cows into "Tuberculin Tested" herds, and those concerned with the vexatious and unreasonable condition requiring the farmer to remove from his "Accredited" herd any animal known to have reacted to the tuberculin test. This latter requirement has in the past deterred many "Grade A" milk producers from having their herds tested with a view to producing "Tuberculin Tested" milk.

Another recommendation adopted in the new Order is the revised list of pathological conditions to be looked for in the clinical examination, and the permissive instead of compulsory use of the words "morning" and "evening" on milk bottles or cartons.

Under the new Order the producer of "Tuberculin Tested" milk may have his herd re-tested at intervals of not less than two months in order to expedite and facilitate the eradication of bovine tuberculosis from herds.

Another restriction of importance to the profession, and one that is likely to be controversial, is the ban that is now placed on the use of live abortion vaccine in "Tuberculin Tested" herds.

The only other notable change in the Order is the adoption of the methylene blue reduction test in lieu of the bacterial plate count as from January 1st, 1937.

We hope that before long the use of tuberculin will be restricted to the medical and veterinary professions and that all tuberculin used will be of a standard potency.

IRISH FREE STATE STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased from the Government Publications Sale Office, 5, Nassau Street, Dublin, C.2.

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Oireachtas Eireann: Report of Committee: R. 57/1. Horse Breeding Industry. Report of Commission of Inquiry ...	0	3	0	1
Statutory Rules and Orders: 43/36. Diseases of Animals Act, 1894 (Extension to Warble Fly Infestation) Order, 1936	0	1½	0	0½
46/36. Therapeutic Substances (Saorstát Eireann) (Amendment) (No. 2) Regulations, 1936	0	6	0	1

Clinical Communications

OBSERVATIONS ON THE TREATMENT WITH COLCHICINE OF A CASE OF CANINE NEOPLASMIC EPITHELIOMA*

W. SCOTT, F.R.C.V.S., DR. VY. MED. (ZÜR.)
BRIDGWATER

Subject.—A nine-year-old bull terrier.

Previous History.—On November 7th, 1934, we were consulted by Mr. D. H. C., his dog "Bue" having developed a swelling on the posterior border of the semitendinosus muscle of the right leg, midway between the hip and hock joints. The swelling was more or less circular, easily movable, slightly tender to the touch and the size of a small potato. The skin was somewhat discoloured in the centre, as if disintegration was about to take place.

I gave it as my opinion that the tumour was malignant and advised removal. This operation was performed on November 17th, under an anaesthetic, care being taken to remove, in addition, healthy surrounding tissue to the extent of 5 to 10 mm. The wound healed by first intention, and the patient was discharged on November 29th.

At the beginning of the following January another neoplasm formed one-and-a-half inches upwards and forwards towards the penis. It was the size of a large walnut, while further forward in the groin the lymphatic gland was enlarged to the extent of a hazel nut. These were removed on January 5th, 1935, and the patient was discharged on January 17th.

Ten to twelve days later a recurrence was noted at the seat of each operation. The futility of further surgical interference having been discussed with the owner, I got into touch with Dr. Amoroso, who kindly sent me a supply of colchicine.

Treatment with Colchicine

The injections of this alkaloid were started, as will be seen from the chart, on February 2nd, by which time growth had been rapid.

On that date, No. 1 tumour measured 72 by 64 mm.; No. 2 tumour measured 68 by 63 mm. The growth in the lymphatic gland area was not measured owing to its deep-seated origin. Dr. Amoroso suggested an initial dose of 1/40th of a mg. every other day for the first week and subsequently 1/20th of a mg. This was carried out until the latter third of the month of February, when bi-weekly injections were given.

By the beginning of March the disease began to run riot, the tumours increased and later, in addition, a large number of small miliary nodules appeared on the skin of the groin, absorption evidently taking place along the lymph courses.

I then began increasing the dose gradually and injecting every other day.

On March 16th the subcutaneous *cum* intramuscular routes were chosen. In addition, 1 c.c. of the solution was injected into the body of the tumour and another c.c. into the healthy tissue underlying the growth.

Within 48 hours considerable disintegration had taken place and a most offensive smelling discharge followed. In addition, the tumour was treated by injecting the solution in small quantities into the healthy tissue surrounding the growth.

By the latter end of the month of March, in addition to the three major tumours, 16 small nodules had developed along the subcutaneous tissue of the groin—*vide* observation 4.

They varied in size from that of a pea to that of a small bean, were circular and not painful to pressure. A strong solution of colchicine was rubbed into each and within 48 hours the skin covering each had disappeared and the round surface was flattened and covered by a tenacious grey lymph. Three further applications and the nodules had disappeared, leaving a healthy scar tissue behind, which cicatrised very rapidly. Throughout the month of April the *optimum* dosage was reached and a steady improvement was maintained, and by the 31st every neoplasmic element had disappeared.

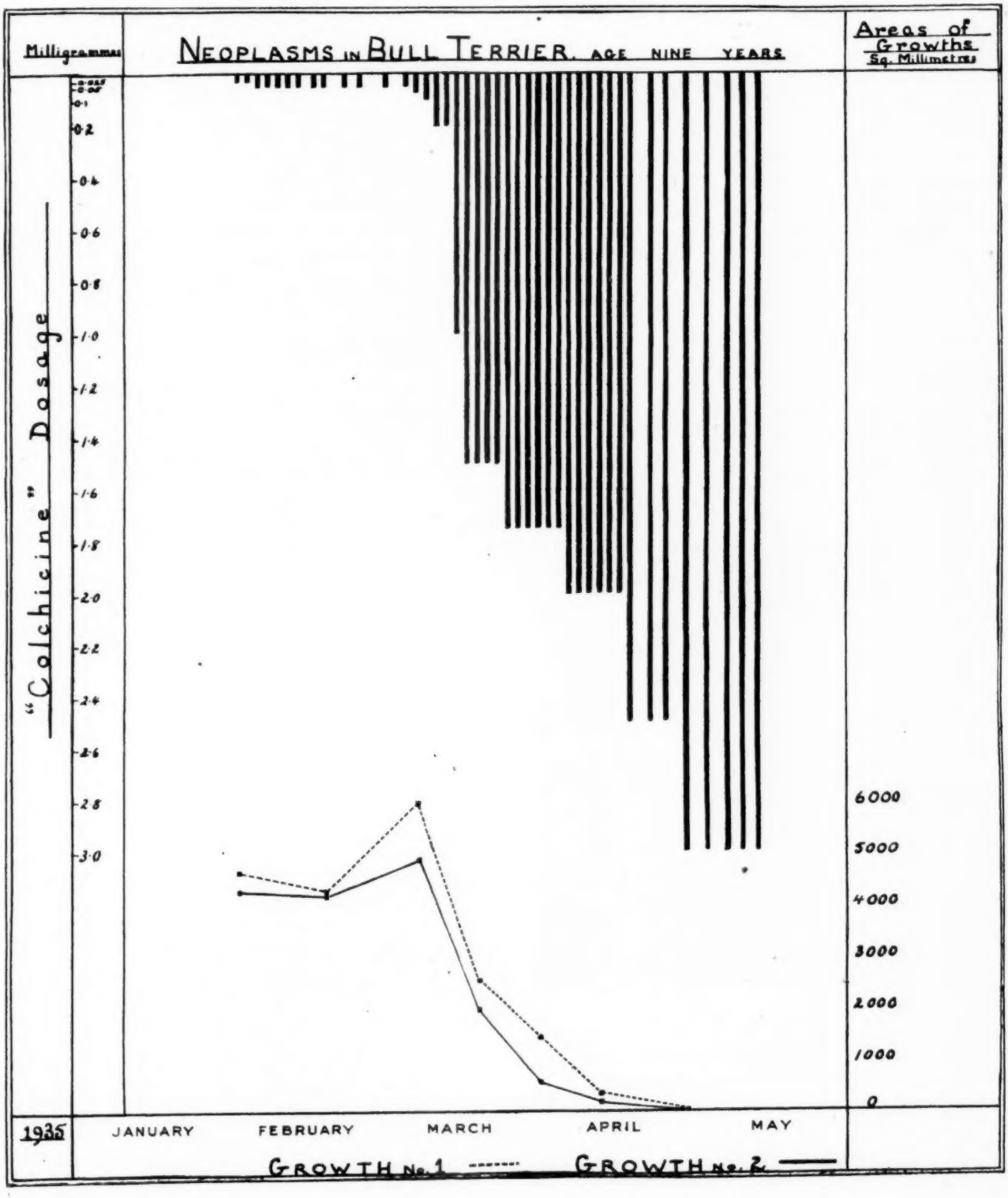
By May 14th—my last visit—the only remaining trace was a cicatrix over the seat of the lymph gland in the groin about the size of a large bean. All the other scar tissue had disappeared nor were there any signs of a subcutaneous thickening at the seat of the growth. On the 15th I had an urgent call to see the patient which on arrival I found dead.

Post-mortem.—After considerable effort I secured the owner's consent to hold a *post-mortem*. All the internal organs appeared to be healthy and there were no signs of metastasis anywhere. The pericardium was full of blood—rupture of the right coronary artery. The history prior to death was that the dog fell downstairs, began to pant heavily and died within two hours. Whether the falling caused cardiac haemorrhage or was consequent upon it I do not know, but it is of interest to relate that his mother died suddenly from internal haemorrhage and he had a brother aged 18 months who died from rupture of the posterior aorta.

Personally I do not think the haemorrhage had anything, immediate or remote, to do with

*Presented to the Annual General Meeting of the Mid-West Division, N.V.M.A., at Bristol, January 17th, 1936.

DR. SCOTT'S CASE: DOSAGE OF COLCHICINE; COURSE AND DURATION OF DISEASE



the colchicine, but this ending was most unfortunate, for one could not say if the cure was permanent or not.

Discussion.—To dogmatise on the merits or demerits of a drug upon experience of its use in a single case would be absurd, but I do think this case brings to light some salient points which are perhaps worthy of emphasis.

(1) No microscopic examinations of the neoplasms were made, but the clinical data were in keeping with the usual skin carcinoma one sees in canine practice. Further, there is no refuting the malignancy, considering the further recurrences after apparently complete excisions. Moreover, Dr. Amoroso saw the case at its apex stage and confirmed my diagnosis as to its malignancy.

(2) The minimum dose exhibited did not appear to exercise, clinically speaking, any specific curative results but, considering the pre-injection galloping course the disease was running, it certainly acted as a deterrent when given every other day; but when the bi-weekly injections were adopted the disease very soon "ran riot."

(3) It was only when the *optimum* dosage was reached that tangible signs of improvement occurred and followed by the *maximum*, the cure became complete in every sense of the word.

(4) I am strongly of the opinion that the intramuscular route for injections carries a higher therapeutic value than the subcutaneous, although the reason does not appear very obvious. The alkaloid must, however, be well diluted. The injection into the neoplasm certainly brings about tissue "breakdown," but in this case it would appear to facilitate also the spread of infection along the lymph tract, as witness the crop of subcutaneous nodules. If this is so, such a method is, of course, fraught with much danger.

(5) The local action of a concentrated solution of colchicine exercises a specific action on neoplasms and hastens their ultimate destruction. It must be pointed out, however, that in this case the system was saturated with colchicine, and whether the local application alone would have any effect I do not know. But this much is certain: the application here of the solution to cutaneous tissue overlying the growths brought about sloughing, etc., but where it was applied to the skin where no growths were located, no epidermal reaction followed. Further, I have rubbed the same solution into my arm with no ill effects. If this reaction is universal and not due to any idiosyncrasy on the part of this patient it may well be proved that colchicine is of diagnostic as well as curative value.

(6) After the dispersal of the neoplasm I was struck with the rapidity with which cicatrisation took place. It seems as if colchicine not only called a halt to *pathological* mitosis but activated a *physiological* mitosis, if I may so use the expression.

(7) At no time during the treatment was there any clinical sign of toxin trouble—certainly no diarrhoea, no diuresis and no general "malaise" were noted.

(8) If one might be allowed to express an opinion on the results of one case, I am forced to conclude that colchicine does exercise a specific action on malignant growths. In this case it should be remembered that they were multiple—three major and 16 minor, not to speak of a wart on the bridge of the nose of three years' standing and which also disappeared during treatment. This case was indeed, by reason of the gross nature of the lesions, a very malignant one where even drastic surgical measures completely failed.

(9) To visit a case every other day, to carry out injections, in veterinary practice is not always easy. Would it not therefore be possible to "buffer" the alkaloid with gum acacia or gum arabic, so that larger doses may be given and, absorption being slower, at longer intervals?

My thanks are due to Dr. Amoroso and Dr. Findlay for kindly supplying me with a sufficiency of the alkaloid.

. . . . .

Discussion

The Chairman (Mr. C. R. Golledge) said that Dr. Scott had given them a very interesting case, which seemed unique—it was unfortunate, however, that it was a single case. He asked if increasing doses were necessary to produce toleration, and inquired about the cost of making colchicine synthetically.

Mr. A. J. Baxter asked what was the actual strength of the solution used for injection and for rubbing into the surface of the skin. He also enquired if the treatment might be suitable for a rodent ulcer on the lower eye-lid of a cat. To the latter question Dr. Scott replied, "Certainly. But you would have to be very careful not to get it in the eye. You would have to dilute the solution."

Captain J. R. Hewer thanked Dr. Scott for a very interesting paper. He wondered if the treatment might be tried on a horse's knees or broken tissue. Would Dr. Scott recommend injections or local applications, and how many doses would be needed? What would be the approximate cost? What had been the cost of treating the dog? Mr. Hewer wondered if, after all, the healthy knee tissue of a horse which was scarred would be affected by the treatment, since Dr. Scott had said that colchicine had no effect on healthy tissue.

Captain J. R. Barker said they ought to congratulate Dr. Scott on carrying out the experiment. He was sure the cost would not stop them from going ahead. "There is one defect in the way the case has been conducted," added Captain Barker, "it would have been much better if a microscopic examination had been made by someone interested in the nature of neoplasms. It would have given a better idea of malignancy apart from the evidence of the multiplicity of the growths. I do not think you

are justified in saying it was malignant epithelioma on clinical grounds alone. None the less, if colchicine will do what Dr. Scott says—and we have no doubt about that—it should be a very useful drug. I still think, however, that the case for colchicine being a treatment for a malignant neoplasm is not quite made out, because he ought to have been working in co-operation with a scientist."

Dr. Scott, replying to questions, said that when one was dealing with a problematical, potent alkaloid such as colchicine almost it was well, and a sound practice, to begin with homoeopathic doses and then gradually to work upwards. He thought that a certain degree of toleration was exercised, and he was quite sure that if he had started by giving, as he ended by doing, three milligrammes of the alkaloid, he would have killed the dog because it had a certain specific effect upon the blood cells and he thought it would dissolve out the haemoglobin of the red corpuscles.

He had hoped to be able to experiment on a second case, but the friend who had hoped to send him a patient was unable to do so.

He should be inclined to gives injections for healing scarred tissue, for colchicine did stimulate cellular activity. He was afraid he could not give any information regarding the cost of the synthetic preparation. The colchicine he used cost him nothing, but he did not know whether the generosity of the "powers that be" would extend to all. If they had a case in which they were specially interested, and would like to try this preparation, he should be only too pleased to send them some he had by him—and he could get a limited supply.

Regarding the strength of the solution he used —one-twentieth part of a milligramme was dissolved out in two cubic centimetres of normal saline solution to begin with. The local application that was employed was a ten per cent. solution, and he increased it proportionately when he gave the higher amounts.

Captain Hewer had asked him whether the colchicine solution should be used locally or in injections in the case of broken knees, with the object of trying to get a fairly rapid union with a minimum degree of blemish. In the case of a valuable horse he should do both—local application and internal injection—because cellular elements would be activated better than if only one or the other was used. For a horse the dose would have to be worked out. He thought he should begin with three to four milligrammes and then watch the result. One could work it out by comparing the weight.

Capt. Hewer had stated that he (Dr. Scott) had said that colchicine had no effect upon healthy tissue. That was right, but it did not follow that, although colchicine did not produce a pathological effect upon the healthy epidermis, it did not activate the epidermal cells, which might have been given increased activity. If it could activate cells surrounding unhealthy structures, he did not see why it should not activate those round healthy tissue.

Captain Barker had called him to book because no microscopical examination had been made. No one regretted that more than he (the speaker). Had he known what he did now, he certainly should have had a portion of one of the neoplasms excised and a microscopical examination made. At the same time, no one would convince him that those neoplasms were not malignant—they were. Captain Barker had seriously questioned the malignant nature of the neoplasms. Considering their recurrent tendencies, their multiple and spreading characteristics—not to mention the general clinical data—Dr. Scott would ask Captain Barker: If they were not malignant what were they?

Dr. Scott also referred to the evidence about the wart on the dog's nose, and concluded: "Colchicine appears to exercise a specific action upon these malignant as well as on those benign growths."

RINGBONE PROBABLY ASSOCIATED WITH TUBERCULOSIS

MAJOR G. E. OXSPRING,
O.B.E., F.R.C.V.S., R.A.V.C.

The subject of this report was an officer's charger, aged twelve years, which first came under the writer's notice in May, 1933, when it was examined by X-ray for obscure lameness, in the off fore leg; the possibility of navicular disease was considered. No abnormality was noticed and the navicular bones in both feet were normal.

The subsequent history of the case was periodical attacks of lameness during light work which usually improved with rest. The severity of the lameness gradually increased until February, 1936, when the animal was sent for further X-ray examination. On this occasion a cavity was observed in the upper third of the first phalanx towards the outer side, and a small bony exostosis on the outer surface of

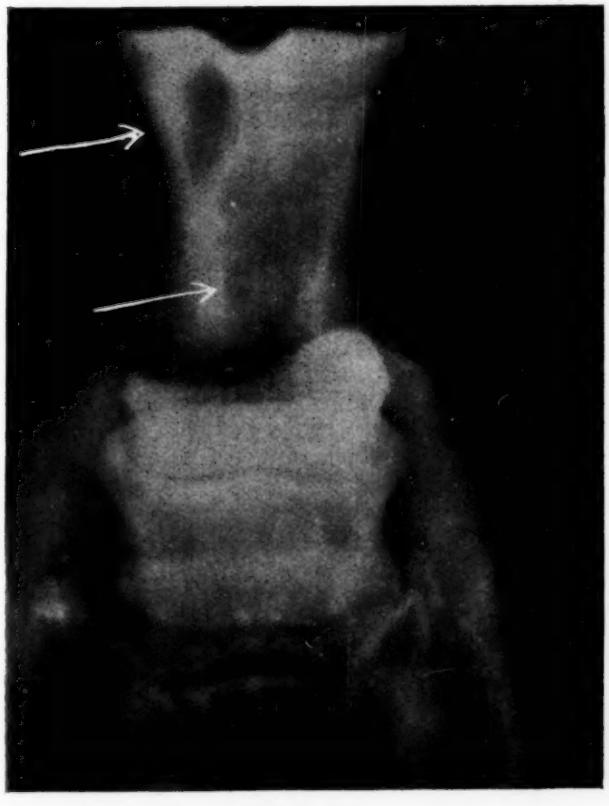


Fig. 1.
Radiograph showing the cavity in the first phalanx, and enlarged marrow space.

the bone in immediate apposition to the cavity. The medullary cavity in the lower third of the first phalanx was also larger and more transparent than normal. These features are to be seen on the reproduction of the X-ray film (fig. 1.).

The animal was destroyed and in accordance with the usual custom in cases of digital lameness, the feet and pastern bones only were sent to the laboratory for examination, so unfortunately no general *post-mortem* examination was made.

The navicular bone with its associated bursa, ligaments, and tendon aponeurosis was quite normal, as also were the second and third phalanges. The first phalanx had an exostosis consisting of irregular bony outgrowths at the upper end of the outer surface, which was identical with the condition known as high ringbone (fig. 2.).

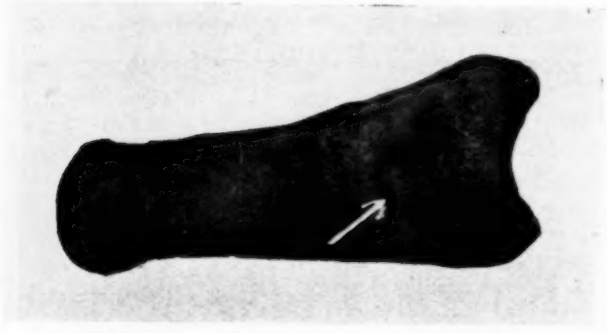


Fig. 2.
The outer surface of the first phalanx showing the exostosis immediately over the cavity.

The cartilage on the upper articular surface of the first phalanx was slightly eroded and discoloured and when removed by boiling, the bone beneath this area presented a small excavation two millimetres in diameter (fig. 3.).

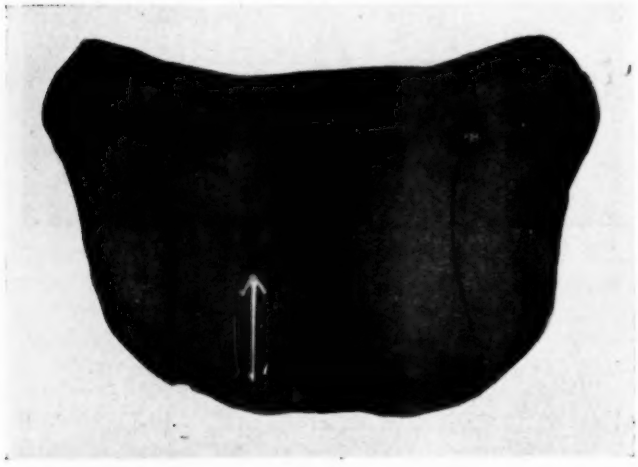


Fig. 3.
The upper articular surface of the first phalanx, showing the erosion.

The first phalanx was divided mesially, but no evidence of the cavity appeared in either half. When the upper-third of each portion was further sectioned in a slanting direction the cavity seen by X-ray in the outer part was exposed. It was about the size of a hazel nut and communicated above by a channel, through which a pin could be passed, with the excavation previously mentioned on the upper articular surface (fig. 4.).

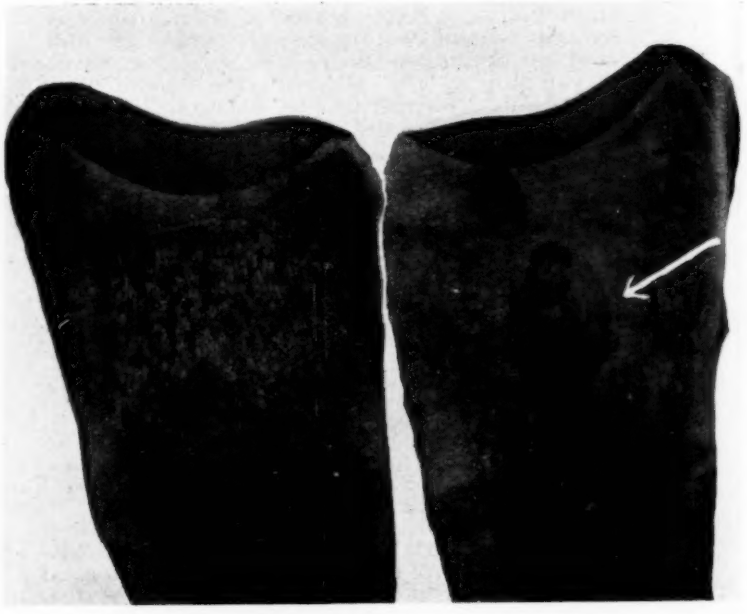


Fig. 4.
Sectioned first phalanx showing the cavity and part of the channel to the articular erosion.

The cavity contained a dark caseous mass, and was surrounded by a hyperaemic zone, which was very pronounced when the bone was first cut. The marrow cavity at the lower end of the bone was larger than normal and the usual cancellated tissue was replaced by a similar material to that found in the cavity described. It was at this stage that the writer suspected a tuberculous origin. The material from the cavity was treated with antiformin, centrifugalised and smears of the deposit stained by the Ziehl-Neelsen method. Acid- and alcohol-fast organisms, morphologically identical with *Mycobacterium tuberculosis*, were plentifully distributed in the smears. Cultural and biological confirmation was denied, because the bone had unfortunately been boiled, but the microscopical demonstration was very characteristic.

It is realised that acid-fast saprophytes exist which might be confused with *M. tuberculosis* and that the biological test is necessary for certain identification. Smears were examined from the marrow cavities and other parts of the remaining digital bones of both limbs, which had been subjected to the same process as the

affected bone, but no acid-fast organisms were seen. The possibility of those present in such large numbers in the caseous mass being contaminants, is considered to be exceedingly remote.

Without X-ray evidence this case would undoubtedly have been diagnosed at the autopsy as high ringbone with articular involvement, and the cause of it probably the irritation from concussion or trauma. The cavity in this case was particularly obvious radiologically, but tuberculous infections of bone may occur which are not so easily recognisable.

It is not suggested that all exostoses have a tuberculous origin, but this incident indicates the probability of it being one of the causes.

A passage from "Special Pathology and Therapeutics," Hutyra and Marek (2nd Edition), volume 1, page 593, runs as follows:—

> *"The suspicion of Poncet and Leriche that numerous exostoses, osteomes, ankyloses and affections of the joints develop as a result of attenuated tubercle bacilli, is at present only based on theoretical foundations."*

Possibly the case described above will provide a practical significance to this theory.

VISION

The review of recent progress in our knowledge of the underlying processes of vision which Dr. R. Granit of the University of Helsingfors contributed to vol. 76 of the *Finska Läkaresällskapets Handlingar* has now been made available to a wider circle by appearing in German in vol. 14 of *Acta Ophtalmologica* (Copenhagen: Levin und Munksgaard, 1936). In his review he insists on the importance of considering visual processes as a part of the physiology of the central nervous system. At points of the optical system where two or more paths for the impulse converge, interaction is possible, which may lead to summation or inhibition. He believes that future progress will be based on the duplication theory, according to which for small intensities of light the rods of the retina are the receivers and at high intensities the cones. He points out the fertility of the flicker method of illumination for investigating the properties of the retina and gives the results of observations, many of which he has carried out himself, on the frequency of the intermittent illumination at which the sensation becomes one of continuous light. He finds that this frequency increases with the logarithm of the intensity of the light, and with the logarithm of the area of the retina over which it is spread.—*Nature.*

Annotation

[I.—Further Studies on the Differentiation of the Virus of Vesicular Stomatitis from that of Foot-and-mouth Disease, with particular reference to a Rapid and Certain Method of Resolving Mixtures of the Two Viruses. Galloway, I. A., and Elford, W. J. (1935.) *Brit. J. exp. Path.*, **16**, 588.]

[II.—Vesicular Exanthema of Swine. Traum, J. (1936.) *J. Amer. Vet. Med. Ass.*, **88**, 316.]

The differential diagnosis of foot-and-mouth disease from certain other diseases such as, *e.g.*, vesicular stomatitis, when based on clinical observations alone, is notoriously unreliable. Although points of difference such as the degree of generalisation in the infected animal and the rate of spread of the disease from one animal to another or from one set of premises to another may provide useful suggestive evidence as to the nature of the disease under investigation, a reliable differentiation based on these observations is not possible. Cattle have been found to be infected under natural conditions with the virus of vesicular stomatitis and, experimentally at least, swine can also be infected with the virus of this disease. The lesions in both these species of animal are indistinguishable from those occurring in infection with foot-and-mouth disease. Recently reports have come from America of the occurrence of another disease in swine which was clinically indistinguishable from foot-and-mouth disease or experimental vesicular stomatitis in this species (*see* Traum, 1936). In test animals this disease differed in certain respects from both of the latter infections, and this suggested that it should be considered as a separate entity; hence it has been termed "vesicular exanthema of swine." Up to the present, it has not been found possible to infect cattle or guinea-pigs with the virus obtained from swine infected with "vesicular exanthema," and, of course, guinea-pigs *can* be infected experimentally by inoculation with the viruses of foot-and-mouth disease and vesicular stomatitis, the lesions produced by these being clinically indistinguishable. Horses are infected under natural conditions with the virus of vesicular stomatitis and have also been infected experimentally by inoculation. There are no accurate experimental observations on record which prove that horses contract foot-and-mouth disease under natural conditions, although this has been suggested by clinical observations [*see* Report of the Foot-and-Mouth Disease Commission of the United States Department of Agriculture (1928), p. 115, "Foot-and-Mouth Disease in the Horse"], and although the horse may be very resistant to infection, the evidence available is insufficient

to determine whether or not some sort of a lesion may not sometimes be produced by inoculation of the virus directly into the mucous membrane of the mouth or tongue. It has been found possible with the virus of "vesicular exanthema of swine" to produce mild localised lesions in the dorsum of the tongue of some horses (16 out of 28) by experimental inoculation. Usually these lesions were unaccompanied by any severe systemic disturbance such as is observed in infection with the virus of vesicular stomatitis. In this connection, it is interesting that Traum has suggested that, although no cases of "vesicular exanthema of swine" have so far been observed in horses under natural conditions, it is suspected that cases may have occurred and that perhaps this would explain some of the failures to transmit the disease experimentally from swine to horses.

The differential diagnosis of a disease simply by consideration of animal species susceptibility is obviously fraught with many possible sources of error. It is known, for example, that in Germany strains of the virus of foot-and-mouth disease have been recovered from swine which could only with great difficulty be transmitted to cattle, and some strains of virus recovered from cattle have only with difficulty been transmitted to guinea-pigs.

Again, although the problem does not immediately concern European or American workers, it is of interest to refer here to the fact that until quite recently it had been accepted that "blue-tongue," or catarrhal fever of sheep, was a disease confined to sheep. Attempts to produce this disease in cattle had generally failed and no records of the disease occurring in cattle under natural conditions had appeared. Since 1932, however, cases of blue-tongue have been proved to exist among cattle [*see* Bekker, J. G., de Kock, G. v. d. W., and Quinlan, J. B., "The occurrence and identification of "blue-tongue" in cattle, the so-called pseudo foot-and-mouth disease in South Africa" —*Onderstepoort J.*, 1934, 2, 393]. In practically every instance when the disease was reported, the owners suspected foot-and-mouth disease. In one instance the disease occurred on a farm very near another premises where foot-and-mouth disease had actually been diagnosed! Lesions were observed on the mouth and feet, and from the reports it is extremely doubtful whether the disease could be diagnosed with accuracy at all stages of the infection by the clinical symptoms alone. Cattle have also been experimentally infected with "blue-tongue" virus, although they appear to be less susceptible than sheep.

To return to the diseases, foot-and-mouth disease and vesicular stomatitis, it has been made sufficiently clear from what has been said above, that it is extremely useful to have at our disposal rapid, certain and relatively economical methods of differentiating between these two diseases. Bearing in mind also the suggestion made originally by the American Foot-and-Mouth Disease Commission in 1928, that the two diseases might occur in the same herd, or indeed in the same animal, simultaneously, and the possibility that under experimental conditions one virus might become accidentally contaminated with the other, if these methods could be applied to the resolution of mixtures the advantages are obvious. Since the fact has been established that there are at least three types of the virus of foot-and-mouth disease and two of the virus of vesicular stomatitis, cross-immunity tests as a possible means of differentiating the two diseases have become very complicated. The question is not simplified when it is realised that there appear to be some strains, believed to be foot-and-mouth disease, which cannot be definitely typed, and there may exist other unrecognised types of the virus of vesicular stomatitis.

Experiments made on large animals such as horses and cattle are costly and require a long time and especially if possible mixtures of the two viruses were being investigated the results obtained might easily lead to false interpretations unless a sufficiently large number of test animals was employed.

Galloway and Elford (1933) showed that the virus of vesicular stomatitis has a diameter of about 70-100 mμ and that this size value, which is the same for the immunologically different strains, "New Jersey" and "Indiana," is about eight times that previously estimated for the virus of foot-and-mouth disease, 8-12 mμ, Galloway and Elford (1931).

Later Burnet and Galloway (1934) reported that it is possible to propagate the virus of vesicular stomatitis in the chorio-allantoic membrane of the developing hen's egg and the most important fact that the inoculation of eggs renders possible the detection of small amounts of the virus of vesicular stomatitis which may produce no reaction by inoculation into guinea-pigs. Employing a standard technique which is described in the present paper, the virus of foot-and-mouth disease was found not to survive even for 24 hours in a total of 58 developing hen's eggs injected. It has been found possible to resolve mixtures of the viruses of foot-and-mouth disease and vesicular stomatitis, irrespective of their relative concentrations, by a method combining filtration with egg inoculation tests. The technique provides a straightforward and relatively economical method of rapidly and accurately distinguishing the two viruses and resolving a mixture of them. It has also been shown that, under experimental conditions at least, it is possible for an animal to be infected simultaneously with the virus of vesicular stomatitis and the virus of foot-and-mouth disease. Both viruses were passaged together successfully in guinea-pigs and each virus was then recovered in the pure state by the method referred to above.

During the course of this work it was found that vesicular stomatitis virus which has been passaged in eggs is found to filter more easily than virus which has been passaged only in guinea-pigs. This suggests that the virus undergoes some slight modification, either in size or surface properties, by passage in eggs. This modification, although definite and not easily reversible, is not of a sufficient magnitude to affect adversely the writers' original conclusion regarding the size of the virus (*v. supra*).

A study was made also of the relative stabilities of the virus of foot-and-mouth disease and the virus of vesicular stomatitis at different hydrogen-ion concentrations. The results obtained confirmed in general the observations of Pyl and his co-workers. The virus of foot-and-mouth disease remained infective over a considerable period at 0°C. at about *p*H 2·5-3·5, *i.e.*, under conditions more acid than the generally accepted *p*H stability limit, 6·5-8·0. Generally this virus rapidly becomes inactivated within the zone *p*H 4·5 to 6·2.

The zone of relative stability of the virus of vesicular stomatitis, on the other hand, appears to be limited on the acid side to about *p*H 4·5 and, in contrast to the virus of foot-and-mouth disease, no second zone of stability is found in a still more acid region. In view of the fact that variable experimental conditions may lead to erratic results, it is essential that every detail be accurately controlled in any attempt to use these observations as a means of differentiation. Even so, a differentiation based on them cannot be wholly reliable. Pyl and Klenk (1933) [in *Z. Bakt.* Abt. I., Orig. **128,** 161] and Pyl (1934) [in *Hoppe-Seyler's Z.*, **226,** 18], for example, were of the opinion that the type of buffer systems used did not affect the results, but Galloway and Elford's observations show that the results may be affected by the different methods of adjusting the *p*H value.

Pyl and his co-workers have advanced what has been termed a "realkalinization" test for differentiating between the two viruses, foot-and-mouth disease and vesicular stomatitis. It is based on the observations made on the relative *p*H stabilities of the two viruses referred to above. Galloway and Elford, however, give reasons for their conclusion, drawn from experimental observations, that no accurate differentiation of the two viruses can be based on this "realkalinization" test.

Work with the virus of "vesicular exanthema of swine" is hampered at present by the fact that no small experimental animal has as yet been shown to be susceptible to the virus, swine and horses being the only animals so far infected with it experimentally. It would be extremely useful to be able to determine the size value of the virus, but until a susceptible small experimental animal is found, extensive filtration experiments are not possible. It would also be useful to know if the vesicular exanthema virus can be propagated in eggs. Information on these points would be useful as a basis of accurate means of differentiating the virus from that of vesicular stomatitis or foot-and-mouth disease. Reppin and Pyl (1934) [in *Arch. wiss. Tier.*, **68,** 183] concluded that there is an immunological relationship between the viruses of vesicular stomatitis and "vesicular exanthema of swine," but Traum states that cross-immunity tests in horses failed to show this relationship, and further suggests that there may be different types of the virus of "vesicular exanthema of swine" as in the cases of vesicular stomatitis and foot-and-mouth disease. The interpretation of cross-immunity tests, therefore, is very difficult. Reppin and Pyl also stated that in their "realkalinization" test the virus of vesicular exanthema of swine behaved like the virus of vesicular stomatitis and not like that of foot-and-mouth disease.

Summarising the results of the experiments reported on in the papers by Galloway and Elford and Traum, the most rapid and certain methods of differentiating between the viruses of vesicular stomatitis and foot-and-mouth disease are filtration through standard collodion membranes to estimate the size value, combined with egg inoculation tests, and until further work has been done on the virus of "vesicular exanthema of swine," this disease can only be differentiated from the other two viruses by the fact that it has not yet been transmitted to either cattle or guinea-pigs.

I. A. G.

INSPECTION OF HERDS IN OXFORDSHIRE

At a recent meeting of the Oxfordshire County Council, the Veterinary Services Committee reported that they had considered the duties to be carried out by the chief veterinary officer and other officers concerned, and had reached conclusions which, in their opinion, would lead to more efficient working. With regard to the clean milk supply, dissatisfaction existed in regard to the present lack of uniformity. With a view to obtaining uniform procedure, the committee were inviting local authorities to co-operate by sending their sanitary inspectors to confer with the county council's officers.

The Finance Committee had referred back a recommendation that the county council should be requested to approve of quarterly inspections in connection with the issue of Grade "A" licences being paid for by the council.

Moving the adoption of the report, which was carried, a member said the number of Grade "A" licences had increased tremendously.

Review

The Cult of the Budgerigar. By W. Watmough (London.) *Cage Birds* (1936.) (pp. viii, 296. 6 colour plates, 14 illustrations. 6s. net.)

The growth in popularity of the budgerigar during the past decade has been phenomenal. The ten entries in the Crystal Palace Show of 1924 increased to 1,257 in the Olympia Show of 1934. In the latter year 256 agricultural and local shows provided classes for budgerigars. Apart from its commercial value the bird's popularity among aviculturalists is due to its aesthetic qualities and to its adaptability in outdoor aviaries to our climate. A number of owners have developed the art of management to the exent of liberating their budgerigars for flight and calling them back to their aviaries as is done with pigeons.

The appointments of this book, with its valuable colour and half tone illustrations by R. A. Vowles, reflect credit upon the proprietors of *Cage Birds* who, as publishers, are to be congratulated upon their choice of one of the most eminent bird fanciers as author. Mr. Watmough has devoted about one half of his book to the breeding of the budgerigar, including its types, varieties, colours and markings and heredity, and to the technique of judging. In one-third of the book he has described the approved methods of purchasing, housing, feeding, washing and management of the birds. By the quality of his instruction Mr. Watmough has lifted this book far above the fancier's literature which is usually offered to the public; and the reviewer ventures to hope that books of equal quality concerning pigeons, ornamental waterfowl, canaries and other species of aviary birds will soon be published.

In one important omission the veterinary reader has cause for criticism. Mr. Watmough tells us how budgerigars ought to be managed, and how they are in fact managed by the experienced aviculturalist; but, though implied in his text, he avoids a frank exposure of the unpleasant conditions to which the greater proportion of budgerigars are subjected when as pets they are kept by well-meaning but thoughtless or uninstructed bird-lovers in the "gilded" bird cage of the drawing room. For some time to come it is safe to anticipate that the services of the veterinary practitioner will be sought far more by the pet owner than by the experienced fancier; thus the veterinary surgeon's main job is to explain to his clients how the birds should be housed in a proper cage, fed on proper food at proper intervals, etc. To this elementary part of his subject Mr. Watmough might have devoted a chapter with illustrations of the death-trap cages, utensils, etc., which should *not* be used. Because it is elementary, and of fundamental practical importance, this advice to owners of pet-budgerigars needs to be expressed by one with wide experience, courage and a gift for straightforward expression.

To his veterinary colleagues, who may desire to include budgerigars in their practices, the reviewer offers this advice — study Mr. Watmough's book, examine the products of the fancier's art at the shows and the aviaries of local aviculturalists. This information applied to his scientific knowledge will give the veterinary practitioner confidence to undertake the services of which, as Mr. Watmough tells us, budgerigar owners are in need.

N.V.M.A. Divisional Reports

CENTRAL VETERINARY SOCIETY

The opportunity of hearing Major Frank Chambers, F.R.C.V.S., of Wolverhampton, speak from his wide clinical experience on "The Incidence of Cancer in Domesticated Animals" was much appreciated by those Fellows of the Central Veterinary Society who attended the meeting held on the second of April, 1936, at the Conway Hall, Red Lion Square, London, and the interest of the occasion was enhanced by the contributions made in opening the discussion by Professors Amoroso and McCunn, who spoke of their hopeful experiences in the use of colchicine, by injection, in the treatment of neoplasms.

The President (Captain J. F. Macdonald) occupied the chair, and there were also present Mr. J. H. L. Addis, Dr. E. C. Amoroso, Captain L. S. Balls, Mr. W. F. Barton, Mr. W. Brown, Captain G. Bushman, Mr. H. E. Bywater (Hon. Secretary), Major W. Denington, Dr. Tom Hare, Sir Frederick Hobday, Mr. J. W. H. Holmes, Mr. H. D. Jones, Mr. H. C. P. King, Mr. Herbert King, Mr. N. S. King, Lieut.-Colonel G. P. Knott, Mr. T. J. Maguire, Dr. J. McCunn, Major-General Sir John Moore, Major G. E. Oxspring, Mr. W. Perryman, Miss K. M. Sanderson, Mr. J. S. Steward, Miss M. Stewart, Captain R. J. Stow, Mr. C. N. Thompson, Captain W. K. Townson, Miss O. Uvarov, Mr. P. W. Walker and Mr. J. Willett. Miss K. Morant, Mr. J. Greatorex and Mr. A. P. Wenner were present as visitors.

The minutes of the February meeting of the Society, having been published in the *Veterinary Record*, were taken as read and were confirmed and signed on the proposition of Mr. Jones, seconded by Mr. Perryman.

Correspondence.—(*a*) From Major H. Kirk, Captain S. H. Motton, Mr. J. W. McIntosh, Captain H. L. Roberts and Professor G. H. Wooldridge apologising for their inability to attend the meeting.

(*b*) From the Secretary of the National Association for the Prevention of Tuberculosis, intimating that they were holding their Twenty-second Annual Conference in London from July 16th to 18th and inviting the Society to send a delegate. The chief subject for discussion would be "Tubercle-free Herds, Present Position and Policy." The delegate's fee was one guinea, which included a copy of the papers. Having given the meeting the foregoing information, the Hon. Secretary added that the Society had not hitherto been represented at this conference. On the proposition of Dr. McCunn, seconded by Mr. Jones, it was agreed that no delegate be sent.

(*c*) From the Secretary of the N.V.M.A. with reference to the representation of the Central Veterinary Society on the Council of the Association for 1936-7. The Hon. Secretary stated that the members elected to Council did not take office until the Annual General Meeting of the Association, and it was decided that this matter be placed on the agenda for the next meeting.

(*d*) From the Secretary of the "National" with regard to the resolutions sent by that Society to the N.V.M.A. with reference to the free treatment of the sick animals of poor persons. This letter was dated April 2nd, 1936, and was as follows:—

Consideration was given by the Organising Committee on Tuesday last to the two resolutions with regard to free treatment submitted by the Central Division.

With regard to the one recommending that the N.V.M.A. should immediately call together a committee to investigate the matter, and that all Divisions be asked to nominate members to serve on the committee, it is proposed, as a first step, to address a communication to the Secretaries of all Divisions seeking information on a number of points with regard to the schemes in their areas, and such an enquiry is in course of preparation.

In reference to the second resolution, I am to say that the committee are in full agreement with the Central Division that on grounds of common humanity the animals of the poor, when sick and in pain, are entitled to have proper diagnosis and treatment of their illnesses by Members of the Royal College of Veterinary Surgeons just as much as are the animals of the well-to-do and that it is inhumane that they should be experimented upon by unqualified persons.

I also brought before the committee your letter bringing to the notice of the Association the refusal of the Finchley, Golder's Green, Hendon and District Branch of the R.S.P.C.A., to grant the Division representation on any of their Clinic Committees. The Association is seeking the assistance of Colonel P. J. Simpson in this matter. As you may be aware, Colonel Simpson is a member of the Council of the R.S.P.C.A.

The President said that it appeared that there was nothing further that they could do about that matter at the moment; the "National" were evidently taking action.

A Notable Centenary

Dr. McCunn here rose to say that, with the President's permission, he desired to place a proposal before them at that stage, although it did not arise under the heading "Correspondence." As they all knew, there was a society at the Royal Veterinary College called the Royal Veterinary College Veterinary Medical Association and it was an interesting fact that that Association gave birth to the Central Veterinary Society. Originally the students and practitioners in London combined to form the society, which held its meetings in the Royal Veterinary College and at various taverns. This year, 1936, was the centenary of the foundation of that Society and, so far as could be made out, it occurred at about November. The members of the Council of that Society had asked him to put before the Fellows of that Division this request—whether the Fellows of the Division would be prepared to join with the members of the R.V.C.V.M.A. in celebrating in some suitable way the centenary of the Society which, as he had said, gave birth to the Central. He thought the best thing to do would be for the Society, first of all, to say whether they were prepared to join in with that celebration and, if so, to inform the R.V.C.V.M.A. to that effect and then let a few representatives join with representatives of the College Society to form a committee and formulate some scheme.

The President commented that it seemed to him that the idea that the two societies should combine to celebrate this important event was a very good one and likely to make the affair more successful.

Mr. Jones supported, adding that he thought that such an action would be a good way of giving some concrete recognition of the Society's appreciation of the many acts of kindness received by that Society from the Principal and staff of the Royal Veterinary College. He proposed, therefore, that the idea of amalgamation with the R.V.C.V.M.A. for this purpose be approved.

Mr. Perryman seconded the proposition, which was carried unanimously, and it was further agreed that the Society should be represented on the joint committee by the President and Hon. Secretary and Mr. Cyril King, it being understood that Dr. McCunn would be serving on the committee from the College side.

Elections to Fellowship.—There being no nominations, the meeting proceeded to the unanimous election of the following gentlemen: Colonel J. O. Andrews, Headquarters, Eastern Command, Horse Guards (proposer, the President; seconder, Vety.-Colonel G. Rees-Mogg); Mr. G. K. Peace, Culverton Lodge, South Street,

Dorking (proposer, Professor McCunn; seconder, Captain Stow); Mr. J. Steward, Shire Hall, Maidstone (proposer, Professor McCunn; seconder, the Hon. Secretary).

Paper.—In the regrettable absence of any morbid specimens or cases of interest—a most unusual omission for this Society—the President proceeded to call at once upon Major Frank Chambers to present his paper, "The Incidence of Cancer in Domestic Animals."

Major Chambers, in introducing his paper, said that he very much appreciated being asked to read a paper before a society of that calibre, especially as the profession looked upon the Central Veterinary Society as the premier Veterinary Society in Great Britain. It was some twelve years ago since he read a paper before them on a subject which he had the temerity to call "Specific Nephritis"; that assertion, he thought, was borne out to-day by recent researches and he was not so far away as he thought he was two or three years after he read the paper.

That night, however, he wanted to say a few words regarding the incidence of cancer in domesticated animals. It was rather a difficult subject to tackle, because one had got to take it from either the statistical point of view or the clinical point of view. Statistics were rather inclined to be dry, whereas from the clinical point of view it was rather the work of the expert, should he say, and he, personally, knew nothing new from the clinical or surgical point of view to bring before them. There was, however, material available from the histological aspect, but unless they had someone up-to-date to present it, its presentation was apt to be rather a farce. One looked towards the Veterinary Colleges to undertake research of a statistical nature, because the practitioner had neither the time nor the inclination to undertake research of that character.

Concluding his preliminary observations, the essayist said that, at the end of his paper, he had made a list of all the growths he had taken away during the twelve months ended March 20th, 1936, that had been sent for histological examination; if time allowed he could go into them and show what the ultimate result had been from the surgical point of view. [Major Chambers' paper is reproduced, together with a report of the discussion and of the essayist's reply, at the commencement of this issue.—*Editor.*]

On the call of the Hon. Secretary a hearty vote of thanks was accorded Major Chambers for his very interesting paper, to Dr. Amoroso for opening the discussion and to the President for his conduct in the chair.

H. E. Bywater, *Hon. Secretary.*

MID-WEST V.M.A.*

ANNUAL GENERAL MEETING AT BRISTOL

The Annual General Meeting of the Mid-West Division of the National Veterinary Medical Association was held at the Royal Hotel, Bristol, on Friday, January 17th, 1936, when there were present Captain W. A. Austin, Mr. C. R. Golledge, Captain J. R. Barker, Messrs. A. J. Baxter, E. Brown, S. Codrington, A. B. Fewings, A. E. Gachet, S. V. Golledge, F. B. Hardy, Lieut.-Colonel G. E. Henson, Captain J. R. Hewer, Messrs. F. C. Hobbs, J. L. Perry, B. Sayer, W. Scott, W. R. Watson and C. E. Perry (Hon. Secretary). Mr. F. J. Paterson and Mr. W. Tweed attended as visitors.

Apologies for inability to attend were received from Sir Frederick Hobday, Messrs. T. J. Margarson, J. C. Coleman, A. E. Roberts, R. Moore, J. J. Aveston, W. D. Rees and H. C. Wilkins.

In the absence of the President (Mr. T. J. Margarson), the Hon. Secretary proposed that Mr. C. R. Golledge should take the chair and, this having been approved, the minutes were taken as read and were signed.

Report of Council Meeting.—From the report of the Council meeting arose the matter of the payment of fares of the Division's representatives to meetings of Council, National Veterinary Medical Association. Council recommended that the full fares of the Secretary and half the fares of other representatives should be paid.

Captain J. R. Hewer said the Secretary was their permanent representative in virtue of his position, and it was a decided tax upon his time and money. Committee meetings entailed a night in town and two days away from one's practice. If the Mid-West Association wanted representation it should be prepared to pay for it.

The Chairman said Mr. Perry had represented them for many years and had always borne the expense himself. Now the Council thought it was only fair they should pay his full fares.

The Hon. Treasurer, Lieut.-Colonel G. E. Henson, said they could afford to do this, and the proposal was then carried unanimously.

Finance.—The Hon. Treasurer then gave his report, saying the accounts were in two separate divisions, the Benevolent and the General funds. Of the Benevolent Fund there was nothing to report. They had three consols, and the increase in the bank balance was due to the interest. The bank balance last year had been £42 1s. 4d., and £5 16s. 4d. interest made the sum of £47 17s. 8d. on current account at the bank. There had been no expenditure.

In the General Account, expenses came to £28 13s. 4d. Receipts from subscriptions totalled

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£28 7s. and the interest from one consol was £2 10s. The balance from the last account was £69 9s. 3d., which made a total income of £100 6s. 3d. On the expenditure side, expenses had been £28 13s. 4d., while £70 1s. 5d. had been brought forward, making a total of £98 14s. 9d. Expenditure and receipts, therefore, practically balanced. They had had one large item of expenditure last year which should not recur, so that the balance ought to be larger.

The Chairman observed that the accounts were quite good, since their numbers had been depleted by the formation of the South Wales Division.

The accounts were then carried unanimously.

Captain J. R. Hewer pointed out that the money in the Benevolent Fund was lying idle, and asked why they should not send some of it to the Victoria Veterinary Benevolent Fund—or was there likely to be any demand on it?

The Hon. Treasurer replied that he did not know of any likely call upon their own fund.

Captain Hewer having proposed that £25 should be sent as a donation to the Victoria Fund, the Hon. Treasurer recalled that two years ago they had sent £100 to commemorate Mr. Adams, and Captain Hewer then suggested that the £25 should be a further contribution to the "Adams Fund." His motion was then seconded by Mr. S. Codrington and carried.

Secretary's Report

The Hon. Secretary, Mr. Charles E. Perry, then gave his annual report, which was as follows:—

I have to report that during the year we have added four new members. We have also had one resignation. The present membership is 73, including nine honorary members.

During the year we have held four general meetings, with an average attendance of 20; also four Council meetings, with an average attendance of eleven.

Our general meeting was held at Bristol in January, when Captain Barker gave his report on the Twelfth International Veterinary Congress. This report was very interesting and our best thanks are due to Captain Barker for representing us as our delegate at the Congress in New York.

The spring meeting was held at Bristol University, when Mr. J. S. Steward gave us a paper on "Fistulous Withers and Poll-Evil." Mr. Steward has since then given his paper to the Midland Counties Division and the Central Veterinary Society, and I think we should feel very honoured that he presented his paper to us first.

The summer meeting was held in August at Stroud by the kind invitation of our President, when a surgical demonstration was given by Professor Wright, of the Royal Veterinary College, to whom we are greatly indebted. This, however, was essentially a ladies' meeting and our thanks are due to the President for arranging a charabanc tour for the ladies and also providing tea for the members.

The October meeting was held at Swindon, when Major Dalling of the Wellcome Research Laboratory, read a paper on "Immunisation." Here again we are greatly indebted to Major Dalling for coming to Swindon and giving us his most educational paper. Our thanks are also due to the Swindon members who entertained us on that occasion.

I cannot close without mentioning that one of our members, Captain Barker, has been elected President of the National Veterinary Medical Association for this year—a great honour to him, which reflects honour on this Association.

The Chairman, having expressed his appreciation of the report, said that he wished their President was with them, so that he could thank him for the very good meeting they had had at Stroud. Everyone had thoroughly enjoyed it.

The report was then adopted.

Election of Officers

President.—The Hon. Secretary said the Council recommended the appointment of Mr. C. R. Golledge as President. His name was proposed in a telegram from the retiring President, Mr. T. J. Margarson.

Captain J. R. Hewer seconded, saying that Mr. Golledge was a very active member. He was sure that Mr. Golledge would fill the chair with distinction and credit to himself and the Association.

The election was carried unanimously.

Mr. Golledge, in acknowledgment, said: "You do me a very great honour in electing me as your President, and I am fully aware that I shall have to do a lot of work to fill the Presidential chair in the efficient manner in which it has been filled in the past by Mr. Margarson, and before him by Mr. Barker. But I will do my best. I hope you will attend meetings as well as you have in the past, because that is a great help to any president. If we can make the ensuing years as successful as those that are gone I shall feel well repaid for any part I am able to play in the matter."

Vice-Presidents.—Mr. Margarson and Mr. Pugh were elected Vice-Presidents, and after some discussion—during which Mr. Codrington and Mr. Watson declined the office—Mr. S. V. Golledge and Mr. Barker were also elected.

Hon. Treasurer.—The Chairman had great pleasure in proposing the re-election as Treasurer of Lieut.-Colonel G. E. Henson, who had, he said, carried out his duties admirably. This was seconded by Mr. Watson and carried unanimously. The Hon. Treasurer briefly expressed his appreciation of the remarks made concerning him.

Hon. Secretary.—The Chairman also proposed the re-election of Mr. Charles E. Perry as Hon. Secretary. He had, said Mr. Golledge, served them excellently in the past, and he was sure they would get no one else who would do the work so well. A considerable amount of work

was involved in the task which he had taken upon his shoulders so lightly.

Mr. Tweed seconded, and the meeting unanimously approved.

Council.—It was agreed, on the proposition of the Treasurer and Dr. Scott, that two names should be substituted for those of Mr. Bovett and Mr. Robinson. The remainder of the Council were re-elected *en bloc*, and the names of Mr. A. J. Baxter and Mr. S. Codrington added.

Clinical Cases

Dr. W. Scott spoke on "Observations on the Treatment with Colchicine of a Case of Canine Neoplasmic Epithelioma," introducing his account with the statement that, so far as his knowledge went, this was the first case of its kind to be brought before a body of practitioners. Therefore it caused him a great deal of difficulty. It was all spade work, and a lot of it interesting spade work and research work. [Dr. Scott's communication is transferred to the clinical section of this issue, together with a report of the discussion and reply.—*Editor.*]

In the course of supplementary remarks concerning this case—the subject of which was a bull-terrier—Dr. Scott said that Dr. Amoroso, of the Royal Veterinary College, sent him down a supply of colchicine, an alkaloid which was the active principle of the autumn crocus. He believed, however, that now it was being prepared synthetically.

In his opinion, this agent had important potential prospects, although he was only speaking after the experience of one case. But this one case was really not of the nature of an isolated case because there were three major neoplasms and 16 minor ones. All subsided in the most marvellous manner, and while the conclusions one drew from that might be hypothetical and conditional, nevertheless he had a very strong idea that here they had something that was going to be heard of in the future in the treatment and cure of cancer in the higher as well as in the lower animals. He was convinced, also, that although the avenues of research were many and devious, they must look to the vegetable and not to mineral or animal or biological sources for a cure.

Just to show them the degree of ignorance that existed on the question of dosage alone when he started that treatment, he might say that he was advised to give no more than 1/40th of a milligramme to begin with for the first two weeks, and then strengthen to 1/20th part. That animal ended by taking 3 milligrammes, which showed that they were dealing with an almost homoeopathic dose to begin with.

The case went on and ultimately the malignant elements all disappeared—and disappeared in the most extraordinary fashion; so much so, that he had now great faith in the efficacy of that active alkaloid of the autumn crocus.

Dr. Scott then illustrated his case by means of a graph. [Also reproduced with the case report.—*Editor.*]

Administration of colchicine every other day (continued Dr. Scott) produced a certain recession of the disease. Then he began the bi-weekly treatment, and they would find a gradual ascent in the development of the growth until it reached the high-water mark of 6,000 square millimetres for the largest neoplasm and 5,000 square millimetres in the second. He then increased the dosage, beginning with 1/40th part of a milligramme and then 1/20th for twelve days, but some of them were bi-weekly. The two neoplasms ran riot. At this point he became bolder and gave 0·2 of a milligramme and worked down to a milligramme, which brought a sudden recession in the size. By April 1st he was giving 1·8 milligrammes and the diminution was rapid until the end of the month, when the size was almost down to zero. At that stage the dosage was 2·5 and 2·6 and ultimately to 3 milligrammes. After that came the entire disappearance of all the neoplasms.

Dr. Scott, who stated that the dog weighed about 65 lb., said that by observing the results of rubbing colchicine into the skin he judged it to be diagnostic as well as curative.

Torsion of the Uterus in the Bitch.—Mr. C. R. Golledge then gave a paper on "Torsion of the Uterus in the Bitch," the bitch being a Sealyham three years old, whelping for the second time. He exhibited a specimen in connection therewith.

"*A Peculiar Condition met with in Fattening Bullocks.*"—Mr. A. J. Baxter spoke on this subject, saying that he wanted to know if anybody else had met with a similar condition. Mr. Baxter's observations were as follows:—

"These fattening bullocks were fed the usual rations, but they failed to put on any flesh; in fact, they lost. The trouble probably started with a bunch of bullocks bought by this man about four years ago. They had walked from the vendor's place in two days, and the weather was very bad, and when they arrived they did not appear to have stood the journey very well; in fact, they never made good bullocks at all. The year after that, when he had a little trouble with the bullocks fattening, he did not take the matter very seriously. Last year, however, he got very worried about it and brought in the agricultural organiser, who, however, could not find anything, and suggested that Mr. Menzies, the Advisory Officer, should be consulted. I was there at the time and none of us could make very much of it. We could not see anything wrong with the feeding or the

water supply, so we conducted a *post-mortem* examination on one of the beasts.

"This year the trouble started soon after bringing the bullocks into the yard. I did not get to work until they had been in the yard about three weeks; then two were left in and the rest were turned out into the field; the latter got all right again and are holding their own."

Mr. Baxter described the symptoms of the affected bullocks and proceeded: "There was little to be found on *post-mortem*. There were slight patches of inflammation; few parasites were present. This year we killed another beast and found much the same thing. Quite a fair carcase, but not as much fat as there should be. In this case I did not see the intestines opened, but Mr. Menzies took specimens for examination, and I heard from him that the condition revealed was very much the same as before. One lymph gland was somewhat haemorrhagic. He took cultures and found nothing.

"We are in communication with Cambridge on the matter and we have just brought another bullock into the yard to get that affected. All these bullocks have had different feeding. The water comes from the house and goes into the barn and on to cottages. We are quite in the dark as to the cause of the trouble. Last summer all the yards were cleaned out and disinfected and left vacant the whole of the summer. The yards are surrounded by a dry stone wall and have stone bottoms."

Captain Hewer thanked Mr. Baxter for bringing the case forward and asked: "Is this an isolated case on one farm only? Were they imported bullocks? Did the cattle turned out on the pasture receive the same feeding as those in the yard?"

The Chairman remarked that he thought it was impossible to disinfect a yard with a loose stone bottom, and asked what were the ages of the bullocks.

Mr. Fewings asked if there was any yellowing of the mucous membrane and if the *post-mortem* examination had shown the liver to be absolutely healthy.

Dr. Scott observed that he was greatly struck by the clay-coloured faeces, which was a feature characteristic of liver trouble. He could not help thinking that Mr. Baxter was dealing with something in the nature of original liver trouble, and that it was possible that it might culminate in a diseased condition of the blood—which led up to the other vital point: why was a blood test not made?

Mr. Baxter, replying, said that he heard in 1935 that there was one other place in which bullocks were in the same condition: the owner of these bullocks saw those they had been discussing and said they were practically the same. The bullocks must have come from practically all over the country: he did not know if there were many Irish beasts among them.

The feeding in and out of the yards had been practically identical. The beasts outside had held their own and were as well as one could expect them to be in the weather they had experienced. They had not scoured.

He agreed that it was virtually impossible thoroughly to disinfect that yard. As to their age, they were quite well-grown beasts, more or less fit for fattening when bought.

There was nothing particular about the eye or mucous membrane, although the latter might have been somewhat pale. There was no jaundice and the liver showed nothing externally. Although the faeces were clay-coloured, they were not as bad, perhaps, as he had led them to think, but more clay-coloured than one would expect in a bullock.

Calcium Deficiency due to Feeding Maize Flake?—Captain J. R. Hewer said that he had had six or eight cows brought to his notice recently suffering from so-called calcium deficiency, exhibiting symptoms of milk fever about half-way through their lactation period. Four or five cases occurred on one farm and the farmer said to him that it was a curious thing that several of these cases had come on when cows had got loose in the barn and helped themselves to flaked maize. Then they had developed this symptom of staggering.

Those they had seen had presented the peculiar walk of milk fever or calcium deficiency, and they had treated them with injections of calcium and they had responded in about 24 hours. Others had not been so severely attacked and the owners had let them take their chance. They all scoured for a day or two and in most of those not treated the symptoms seemed to pass off.

The feeding of maize flake might have been a coincidence. The brother of this farmer had a cow which appeared to be suffering from milk fever. She was injected but went "all to pieces," and they slaughtered her. No *post-mortem* examination was made. One of the brothers, who lived about six miles away, was very sceptical about this maize question, but when he went home he was told some of his cows had been at the maize flake—and two of them developed similar symptoms the next day. They were given calcium treatment and responded.

The curious thing about the matter was this maize flake factor. They had taken a fair quantity. Had anyone else met with a case of this sort?

Captain Barker said he should think the evidence was of toxaemia rather than calcium deficiency. They wanted a little more direction concerning what were known as milk fever cases. At the moment he was sending samples

of blood to the Ministry of Agriculture from similar cases, which had not had access to flaked maize. Wheat poisoning sometimes was a very serious thing in the case of valuable horses, but he did not know if there was such a thing as flaked maize poisoning. If Captain Hewer had any further cases, he should take a blood sample at the actual time the cows went into that particular condition.

Mr. Tweed referred to a cow he had seen the previous week, saying that she exhibited some symptoms typical of milk fever. She was an old cow, four months calved. On auscultation, he observed what he thought to be one little area of tuberculosis in the lungs, and for a few minutes he was going to leave her and say she did not come under the Order. He did take her under the Order, however, and she was the worst case of tuberculosis he had ever seen. This was a type of case of which, he thought, one must be wary. There were several symptoms exactly similar to those met with in milk fever.

Captain Hewer pointed out that he was not suggesting that his cases were those of milk fever; he said there were similar symptoms.

Membership.—Mr. Tweed, of Taunton, and Mr. Patterson, of Shepton Mallet, were nominated as members of the Association, and the meeting concluded with a hearty vote of thanks to the Chairman, moved by Dr. Scott.

C. E. Perry, *Hon. Secretary.*

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ROYAL COUNTIES V.M.A.*

MEETING AT WEYBRIDGE

The spring meeting of the Royal Counties Division of the N.V.M.A. was held on Friday, April 24th, at the Veterinary Laboratory, New Haw, Weybridge, by kind permission of the Director, Dr. W. H. Andrews, D.Sc., M.R.C.V.S. In the absence of the President (Major J. J. Dunlop) whose professional duties detained him elsewhere, Lieut.-Colonel P. J. Simpson (a Vice-President) was voted to the Chair.

The following members were present: Messrs. J. R. Baxter, N. S. Barron, J. Bell, Major A. C. Duncan, Mr. H. Gooch, Lieut.-Colonel H. Greenfield, Major R. C. G. Hancock, Captain J. R. Hewer, Mrs. Kon, Messrs. G. P. Male, K. N. Scott, Dr. Leslie Sheather, Captain W. K. Townson, Mr. F. W. Willett, and the Hon. Secretary.

The following signed the attendance book as visitors: Dr. W. H. Andrews, Miss K. Baxter, Captain T. M. Doyle, Mr. J. Francis, Mr. A. W. Hart, Dr. Kon, Mr. W. J. Leyshon, Mr. H. Meve, Mr. J. M. L. Penhale, Mr. W. A. Pool, Mr. F. R. Spratling, Mr. W. J. Barclay Watson.

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Apologies for absence were received from the following. The President (Major J. J. Dunlop), Captain R. E. C. Bullen, Mr. T. A. R. Chipperfield, Captain J. A. Craft, Sir Frederick Hobday, Major H. G. Lepper, Mr. J. W. McIntosh, Major-General Sir John Moore, Mr. H. C. Shingler, Colonel G. K. Walker, Mr. R. A. Willett, and Professor G. H. Wooldridge.

Obituary.—Before proceeding with the business on the agenda, the Chairman referred to the loss which the Association had sustained by the death of Major R. C. Tennant. He (Colonel Simpson) reminded those present of the long and energetic membership of the Division which stood to the credit of the late Major Tennant; during that time he had occupied the Presidential chair in 1908 and had been instrumental in arranging for the Division to visit the Royal farms and stables at Windsor. Reference was also made by the Chairman to the sporting and other qualities which made Major Tennant such a good friend and neighbour. The meeting stood for a moment in silence as a tribute to his memory. The Hon. Secretary was instructed to write to Mrs. Tennant and convey to her and her family the sincere sympathy of the members of the Association.

The Chairman also referred to the serious illness of Mrs. Bullen which prevented Captain Bullen being present, and, on behalf of those present, expressed the hope that Mrs. Bullen might soon be restored to health.

The minutes of the November meeting, having been published in the *Veterinary Record*, were taken as read and signed as correct.

Correspondence.—The Hon. Secretary read the following letters:—

(1) From Mrs. Tennant, expressing thanks for sympathy and the wreath which the Secretary had sent in the name of the Association.

(2) From Sir Frederick Hobday, thanking the members for the letter which had been sent from the January meeting, expressing the hope that Lady Hobday would soon be restored to health.

(3) From Dr. Bullock, acknowledging with thanks a donation of £1 1s. 0d. plus a subscription of £2 2s. 0d. to the Library Fund of the Royal College of Veterinary Surgeons.

(4) From the N.V.M.A., conveying a request from the Organising Committee that members concerned in schemes for the treatment of sick animals of the poor be asked to give details as to the working of such schemes, it being felt that these schemes had an important bearing on the welfare of the profession, and that the whole position should be reviewed. Forms were enclosed with the letter indicating the nature of the information required. The Hon. Secretary was instructed to send a form to every member.

Election of Representatives to serve on Council of the N.V.M.A.—Mr. J. Willett and Captain Craft were duly elected.

Election of Delegate to the Royal Sanitary Institute Congress.—It was agreed that the President or his nominee be the delegate.

Election of New Members.—Mr. J. G. Salt, of Bicester, Oxon, and Dr. A. C. Fraser, of Lambourn, Berks., were unanimously elected to membership.

Place of Next Meeting.—As has been the usual custom, it was decided to leave to the President the selection of the place for the summer meeting.

. . . . .

At the conclusion of the meeting Dr. Andrews welcomed the members to New Haw, and said that he hoped they would find something to interest them in their inspection of the work which was going on. He apologised for the paucity of space but told them that the buildings were being enlarged, and he hoped that when the Association again visited New Haw there would be ample room for their requirements.

Dr. Andrews then indicated several departments which were open to inspection and suggested that the members should go as they pleased to whichever was likely to interest them. Dr. Andrews said how sorry he was that owing to the illness of Mr. Taylor the parasitology section would not be open to inspection.

PROGRAMME

Dr. Green, Mr. Eden, Dr. W. Allcroft, Dr. R. Allcroft; Bio-Chemistry.

Mr. Norman; Dissection of dog's brain for diagnosis of Rabies. Photographs, sections, etc.

Mr. Franklin; Anti-Abortion Vaccine.

Mr. Doyle and Dr. Slavin; Bovine Contagious Abortion.

Mr. Dobson and Mr. Gordon; Diseases of Poultry.

Mr. Penhale and Mr. Reid; Anthrax, Swine Fever and Erysipelas, and Tuberculin tests.

Mr. Pool and Mr. Edwards; Imperial Bureau of Animal Health (*Veterinary Bulletin* and *Index Veterinarius*).

The members were afterwards entertained to tea by Dr. Andrews and the staff.

Lieut.-Colonel P. J. SIMPSON, on behalf of the visitors, proposed a very hearty vote of thanks to Dr. Andrews and the members of the staff who had done so much that afternoon to make the Association's visit a pleasant and instructive one, also for their hospitality. Colonel Simpson remarked that it was not the first or second time within recent years that the Royal Counties had accepted the kind invitation of Dr. Andrews and his staff, and he ventured to say that it would not be the last time. He expressed the hope that Mr. Taylor might soon be able to resume his work.

The vote of thanks was carried with acclamation.

Dr. ANDREWS thanked Colonel Simpson for his remarks and said that it was a great pleasure to those at Weybridge who were engaged in laboratory work to meet those who were at work in the field; he was sure it was to their mutual advantage to meet in this way. He hoped that the next visit to which Colonel Simpson had alluded would take place at some date not far distant.

H. BELL, *Hon. Secretary.*

In Parliament

The following questions and answers have been recorded in the House of Commons recently:—

HORSE-DRAWN VEHICLES (CENSUS, LONDON).

Mr. DAY asked the Minister of Transport whether he will state the result of the latest census taken of horse-drawn vehicles which pass certain important points in the London area under his jurisdiction; and whether the number of these horse-drawn vehicles is decreasing?

Mr. HORE-BELISHA: The numbers of horse-drawn vehicles and of all vehicles (including pedal cycles) recorded in the census taken in the years 1931, 1933 and 1935 by the Metropolitan and City of London Police at 95 comparable census points in London were as shown below. The figures relate in each case to a period of twelve hours on a week day in July.

	1935.	1933.	1931.	Percentage Increase (+) or Decrease (−) 1935 over 1933.	Percentage Increase (+) or Decrease (−) 1935 over 1931.
Horse-drawn Vehicles	64,057	79,556	104,421	− 19·5	− 38·7
All Vehicles (including Pedal Cycles). ...	2,497,661	2,299,898	2,161,231	+ 8·6	+ 15·6

SLAUGHTER OF ANIMALS

Mr. DAY asked the Minister of Health the number of local authorities in England and Wales who have statutory power to adopt the Ministry of Health's model by-law 9b, with reference to the humane slaughter of animals, and who have not done so; and whether he would give particulars?

Sir K. WOOD: This matter is now in the main governed by the Slaughter of Animals Act, 1933, which came into force on January 1st, 1934, and applies to the slaughter of cattle and, where a source of electrical supply is available, to the slaughter of pigs. The Act may, also, by resolution of the local authority, be applied to the slaughter of sheep. Out of 1,507 local authorities who have power to pass such a resolution, 920 have done so. The Act in effect supersedes these by-laws as regards cattle, and also as regards sheep in areas in which sheep have been

brought within the scope of the Act by resolution and as regards pigs in areas in which a source of electrical supply is available. By-laws relating to the slaughter of pigs in areas in which a source of electrical supply is not available have been made by 27 further authorities since the Act came into operation.

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PERFORMING DOGS

Sir R. GOWER asked the Minister of Agriculture what steps are taken by him to ensure that performing dogs, permitted by licence to land in this country, subject to quarantine, not on approved veterinary premises but on the premises at which they are to perform, are kept in places suitable for the purpose and under conditions providing for their care, comfort, and proper exercise; and whether the dogs while there are inspected by any veterinary or other officer on his behalf and at what intervals?

Mr. ELLIOT: Imported performing dogs are not licensed for quarantine at premises at which they are to perform unless such premises have been previously inspected by officers of the Ministry and found to be suitable for the proper detention of the dogs. While the dogs are on the premises inspections are made, without warning, and normally every week, by inspectors of the Ministry and of the appropriate local authority.

EDINBURGH VETERINARY COLLEGE EXTENSION APPEAL

A public appeal for £20,000 to enable an extension to be made to the Royal (Dick) Veterinary College, Edinburgh, is to be made by the Board of Management.

"The Board have for some years been considering the question of extending the College buildings," it is stated. "This has become much more urgent during the last two years; all the departments are overcrowded, and it is impossible to maintain adequately the high standard of teaching at which the College has always aimed unless additional accommodation in the way of laboratories and lecture rooms is provided.

"That the provision of increased accommodation is imperative has been recognised by the Development Commission, the Agricultural Research Council, and the Department of Agriculture for Scotland. The urgency of the position arises from the extension of the curriculum and the desirability that the College should extend its activities in the field of research.

"It has been intimated that a grant of £1 for £1 from Government sources will be made in order to meet the estimated cost of the extension up to a maximum grant of £20,000; in other words, the cost of the extension will probably amount to £40,000. A site has already been secured for the new buildings.

"The governing body of the College has therefore determined to make a public appeal for £20,000, and an influential committee has been formed to support the appeal."

In connection with the scheme a meeting was held in the City Chambers on Thursday last, when plans for the raising of the necessary funds were discussed,

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

June 3rd.—N.V.M.A. Committee Meetings at the Royal (Dick) Veterinary College, Edinburgh.

June 4th.—N.V.M.A. Council and Committee Meetings, at the Royal (Dick) Veterinary College, Edinburgh.

June 4th.—Visit of the Central Veterinary Society to the Museum of the Wellcome Research Institute, 183-193, Euston Road, N.W. Business meeting at the same address.

June 4th.—R.C.V.S. Annual Meeting and Luncheon in Edinburgh.

June 8th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, 4 p.m.

June 11th.—D.V.S.M. Examination begins.

June 11th.—Meeting of the Lincolnshire and District Division, N.V.M.A., at Peterborough, 2.30 p.m.

June 12th.—R.A.V.C. Annual Dinner, Grosvenor House, W.1., at 8 p.m.

June 19th.—Meeting of the Southern Counties Division, N.V.M.A., at Tidworth, 2.30 p.m.

June 24th.—R.C.V.S. Committee Meetings.

June 24th.—Victoria Veterinary Benevolent Fund Council Meeting.

June 25th.—R.C.V.S. Committee Meetings.

June 26th.—R.C.V.S. Committee and Council Meetings.

June 29th.—R.C.V.S. Membership Examinations begin.

July 2nd.—R.C.V.S. Oral and Practical Examinations begin in London.

August 22nd.—Entries for Jubilee Memorial Bursary Examination.

Sept. 14th-18th.—N.V.M.A. Annual Congress, Scarborough.

Sept. 22nd, 23rd.—Jubilee Memorial Bursary Examination.

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THE N.V.M.A.: HIS MAJESTY'S PATRONAGE

His Majesty the King has been graciously pleased to grant his patronage to the National Veterinary Medical Association. The Association is much gratified by this mark of the Royal favour which continues the patronage that the N.V.M.A. enjoyed under His Majesty, when Prince of Wales,

We are glad to learn, also, that His Majesty has honoured the National Horse Association of Great Britain by becoming its Patron.

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N.V.M.A. CONGRESS, 1936, AT SCARBOROUGH

The Provisional Committee, appointed in connection with the above, are confident that Scarborough will prove a very popular meeting place and it should be said that the Corporation are co-operating in every possible way to make the event a complete success. Each member and delegate attending will be presented with a card giving free admission to all amusements, parks, etc., which are under municipal control and this in itself should prove a big attraction.

The Royal Hotel has been selected as the venue at which, it is anticipated by the committee, all the social functions will be held. It is in very close proximity to the public library where the sectional meetings will take place. This latter building has recently been extensively altered and enlarged and appears to be in every way ideal for our purposes.

At the invitation of the Yorkshire Veterinary Medical Society an informal "At Home" has been arranged at the Royal Hotel on the evening of Sunday, September 13th, 1936, at 8 p.m. The "Yorkshire" issue a very cordial invitation to all members to attend this function and it is hoped that as many as possible will endeavour to attend and take advantage of the opportunity of meeting together prior to the official opening of the Congress on September 14th, 1936.

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R.C.V.S. ANNUAL LUNCHEON

We are glad to announce that Professor d'Arcy W. Thompson, F.R.S., President of the Royal Society of Edinburgh, has undertaken to propose the toast of the Royal College of Veterinary Surgeons at the annual luncheon to be held in Edinburgh on June 4th. The President of the Royal College, Mr. J. W. McIntosh, F.R.S.E., will, of course, reply; Mr. P. R. Laird, secretary of the Department of Agriculture for Scotland and Dr. G. Scott Robertson, secretary of the Ministry of Agriculture of Northern Ireland, will reply to the toast of the guests to be proposed by Dr. Bradley.

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R.C.V.S. OBITUARY

Fisher, Edward Hayes, Marsh Lane, Longton, near Preston, Lancs. Graduated London, December 15th, 1893; died May 14th, 1936, aged 65 years.

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Wacher, Gerald, Barrow Hill House, Ashford, Kent, Captain late R.A.V.C. Graduated London, July 17th, 1909; died May 20th, 1936, aged 49 years.

Mr. Gerald Wacher, M.R.C.V.S.

It is with regret that we have to record the death of this popular practitioner, who had been medically attended since last August and who passed away in Canterbury Hospital.

Mr. Wacher was the second son of Mr. and Mrs. Cooper Wacher, of Eddington, Herne Bay. Going to Ashford in 1909, Mr. Wacher was for many years associated with Mr. F. C. Giffard in a veterinary practice there, but later continued the practice alone. He was well-known in sporting circles, rode to hounds many years and played cricket for the town club.

During the War Mr. Wacher was a veterinary officer attached to the R.F.A. in France, holding the rank of captain. In Ashford he held veterinary appointments under the Ministry of Agriculture and the County Council.

Mr. Wacher leaves a widow, to whom the deepest sympathy of their many friends in the profession will be extended.

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The Late Mr. A. H. Gentle, M.R.C.V.S.

Mr. Alexander Henderson Gentle, M.R.C.V.S., whose death, at the age of 85, we recorded with much regret in our last issue, was a native of Edinburgh. Mr. Gentle, after qualifying as a veterinary surgeon, joined the Volunteers in 1868. He volunteered for the Basuto War, and went to South Africa, where his regiment, the Cape Mounted Riflemen, were stationed at Umtata.

He remained in South Africa until 1885. On leaving the Army he set up as a veterinary surgeon in Kimberley. About 40 years ago he commenced to practice in Otley, leaving the town only recently to reside at Spondon, near Derby, where he passed away.

Mr. Gentle had a fund of stories of his years of service in Africa. He recalled one occasion when General Gordon, then Commander-in-Chief of the South African Forces, rode to a great review of troops in a bowler hat and frock coat, as his luggage had been delayed.

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GENERAL OBITUARY

Dr. Arthur Eastwood

On May 5th, after only a few hours' illness, Dr. Arthur Eastwood died in his 69th year. He graduated in 1901 M.B. of London University, and in the following year M.D. with a thesis on the malignant tumours originating from adrenal remnants. "It was this, no doubt," says *The Lancet*, "which led the Royal Commission on Tuberculosis to call upon Eastwood when in January, 1903, they felt the need of a first-class histologist to study the tissue reactions of their experimental material. For nearly seven years he worked in the 'Royalcot' Laboratory built for him at Stansted, Essex, making up with Cobbett and the brothers Griffith the team of investigators which did so much to render the Commission's Report a monument to British scientific thoroughness and a quarry from which have been dug most of the foundation stones of later work on the bacteriology of tuberculosis."

In 1909, when the Commission came to an end, Eastwood was appointed inspector to the local government board to deal with such outstanding problems as the part played by bovine tuberculosis in the causation of tuberculous infection in children and the degree of infection with tubercle bacilli of the meat of tuberculous pigs. He founded the board's pathological laboratory, and one of its earliest tasks was to investigate the outbreak of rat plague in East Anglia in 1911. On the outbreak of war in 1914 the laboratory

tackled the problem of epidemic cerebro-spinal fever which was regarded as the necessary consequence of the mass congestion of Army life.

In later years Eastwood's philosophical bent was manifested in a long series of articles in the *Journal of Hygiene* on immunological problems, and at one time he regularly reviewed scientific publications for the *British Medical Journal;* his style was unmistakable, and it was a common remark that Eastwood's account of a scientific paper was not only much shorter but much better than the original.

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COUNTY COUNCILS ASSOCIATION AND THE ROYAL VETERINARY COLLEGE

In response to an invitation received from the Royal Veterinary College, the Executive Council of the County Councils Association have appointed Sir Merrik Burrell, Bt., *C.B.E.,* Mr. E. W. Cemlyn-Jones, Sir Edward Holland and Sir Percy Jackson, LL.D., as the representatives of the Association upon the Court of Governors of the Royal Veterinary College, in the event of the Privy Council acceding to the application of the College for a new Charter.

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LEGAL NOTES

Sale of a Horse: Action for Breach of Warranty Fails.—The *Worcester Evening News* reports that the Joint Master of the Worcestershire Hunt, Major H. P. Rushton, of Himbleton, was respondent in an action at the Worcester County Court before His Honour Judge Roope Reeve, when Mr. Richard Charles Brenton, of "Ferndale," Stratford Road, Shirley, Birmingham, made a claim for damages against him for breach of warranty with regard to a horse bought at a sale at Bromsgrove.

Mr. A. J. Flint appeared for Mr. Brenton and Mr. A. P. Marshall defended.

Mr. Flint said that Mr. Brenton bought a bay shire gelding at Messrs. Chappel and Foster's auction sale at Bromsgrove on October 11th, for 23½ guineas.

The conditions of the sale stated that the horse was a "warranted good worker in all gears."

The horse was produced and trotted on grass and Mr. Brenton bought it and sent it to Birmingham. He did not inspect the horse until the next morning, when it was found to be dead lame. The cause of the lameness was pronounced ring-bone which was revealed in a subsequent *post-mortem.*

When it was discovered that the horse was lame Mrs. Brenton immediately rang up the auctioneers and they told her to keep the horse until Monday. She telephoned again the next day and in the meantime the auctioneers got into communication with Major Rushton.

"He immediately ran away from the conditions of the sale," alleged Mr. Flint, "Major Rushton wrote a letter to the auctioneers saying he would refuse to take the horse back or make any restitution with regard to it. He declared it had always been a good worker and that there was nothing wrong with the horse.

"Mrs. Rushton then wrote to the auctioneers stating that it walked on its heels, could not stand the jar of the roads and had been put in a field."

On October 30th Mr. Byner, a Birmingham veterinary surgeon, examined the horse and found it was very lame in the near foreleg due to ring-bone, "and quite unfit for work."

On November 10th Mr. Hiles, a Worcester veterinary surgeon, examined the horse and stated that the knee was only temporarily swollen, and that the horse was not lame, and capable of reasonable work.

The horse was subsequently found dead in a field on January 18th and a *post-mortem* examination revealed that the organs were normal with the exception of the heart, which was enlarged and flabby and 4½ lb. over normal. There was also low ring-bone.

His Honour then interrupted the case to ask if the parties could not reach some settlement.

After an interval, during which counsel conferred with their clients, it was announced that it had been impossible to reach a settlement.

Mr. C. J. Byner, veterinary surgeon, of Birmingham, said he examined the horse on October 30th. It was then so lame that he could not get it to trot. The horse was suffering from ring-bone, which could not have developed in three weeks, but must have been present for some months.

Mr. Marshall: Does ring-bone always make a horse lame?—No.

Does it necessarily mean the horse cannot work?—No, it depends on the degree of the complaint.

Mr. H. W. Dawes, veterinary surgeon, of West Bromwich, said he conducted the *post-mortem* examination on the horse. The horse was in fair bodily condition, with the exception of the heart, which weighed 11½ lb., compared with the normal 7 lb. There was nothing else to account for the horse's death, but it was also suffering from ring-bone to such an extent as to make the latter an identification mark. Mr. Dawes expressed the opinion that the ring-bone was of long standing, at least over six months, owing to the change in the bone.

Major Rushton then went into the box. He said he bought the horse in the autumn of 1932 as a yearling and until October, 1935, it was worked on his farm and on the roads during the summer months. There was never anything wrong with the horse, and although it was not perfect and went on its heels, it was never lame. He thought the horse complied with all the regulations laid down in the catalogue.

Mr. H. B. Hiles, veterinary surgeon, of The Butts, Worcester, said he examined the horse on November 10th and it definitely was not lame. He came to the conclusion that the horse was capable of reasonable work, although it had flat feet.

Answering Mr. Flint, Mr. Hiles said the ring-bone was not so pronounced as to displace the bone. To the best of his knowledge he had never seen the horse before.

His Honour, giving judgment, said that after hearing the evidence of Major Rushton and his bailiff and carter, he could not doubt that the defendant was justified in believing that the horse was capable of reasonable work. "But was it up to the warranty?" he added, "that is what I have to judge. The lameness might have been caused after the time the hammer fell and therefore became the risk of the purchaser, but that is only a supposition.

"There is a complete conflict of testimony between the expert veterinary witnesses, but I do not think it is for me to say who is correct.

"In my opinion the horse was up to the state given in the warranty and therefore the case must fail and I must give judgment for defendant with costs."

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Unsound Meat Prosecution.—Before Alderman Sir William Burton, at the Guildhall Justice Room, E. F. Potter, of Athelstan Road, Colchester, was summoned for sending to the Central Meat Market, Smithfield, the carcase of one pig for

the purpose of sale for food, which was subsequently seized and condemned as being unfit for human consumption. A. C. L. Theobald, Keelers Farm, Elmstead, Colchester, was also summoned for being the owner of the unsound meat.

The Assistant City Solicitor, Mr. MacDonnell, opening the case, said that the pig carcase arrived in London, and when it was received by the commission salesman he called in the sanitary officer as he did not like the appearance of it. Eventually it was seized, and after examination by the Medical Officer for the City of London, it was condemned.

Evidence was given to the effect that the pig was unable to stand prior to being slaughtered, and Theobald took it to Potter, who was a butcher, to have it killed.

Addressing the court in mitigation, the defendant's solicitor, Mr. Proudfoot, said that Mr. Theobald was a retired Lieut.-Colonel and had been farming for only two years, and this particular sow had been under special observation. It appeared to be suffering from rheumatism, so he decided to have it killed. He did not intend it to go to market. Mr. Potter, a man who had been a butcher for many years, slaughtered the animal, cut off the head, and sent it to London, where he thought it would be examined by the City authorities.

Mr. MacDonnell: I think that a good many people in various parts of the country are under the same impression, and the sooner that idea is dispelled the better, for it is altogether wrong.

Mr. Proudfoot: Both these gentlemen are of the highest character, and neither would stoop to a transaction that was illegal to make a few shillings. It may be that both were negligent, but it cannot possibly be said that they acted in a criminal manner.

Sir William Burton: I have listened with care to what has been said on behalf of these two defendants, but the public must be protected. Only sound meat may be sent to the Central Markets, and, therefore, I fine Mr. Potter £25 and five guineas costs. Colonel Theobald will be fined £10 and five guineas costs.

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RICHMOND HORSE SHOW DIRECTORATE

Mr. Romer Hatton, of Paignton, son of Mr. W. J. Hatton, the oldest surviving director of the Richmond Royal Horse Show and one of the best known and most highly respected veterinary surgeons in the Thames Valley, has been elected a director of the Richmond Royal Horse Show. He fills the vacancy caused by the recent death of Mr. F. Vivian Gooch. This is the first occasion upon which father and son have sat as directors of the Richmond Horse Show. Both have been closely associated with this great feature of the horse show season for many years and are familiar figures in the show ring, where Mr. Hatton, sen., will be one of the judges in the jumping competitions with the President of the Society, Mr. Romer Williams, who is Mr. Romer Hatton's godfather.

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VETERINARY INSPECTION IN GLOUCESTERSHIRE

At a recent meeting of the Gloucestershire County Agricultural Committee it was reported that the Diseases of Animals Sub-Committee had considered the mode in which the future veterinary inspection of the county should be carried out, and were satisfied that it was desirable that a whole-time veterinary service should be established. They considered that whole-time assistants should carry out the veterinary duties arising out of the Milk and Dairies Acts and Orders and the Tuberculosis Order, but that at all events for the present some part-time veterinary inspectors should be retained for the remaining executive duties under the Diseases of Animals Acts and Orders. As vacancies occurred among the part-time inspectors it might be desirable, instead of making new appointments to the vacated districts, to amalgamate those with others so as to reduce the total number. The committee thought that to carry out effectively the duties proposed to be allocated to whole-time assistant officers four of such officers would be required. The making of two half-yearly routine inspections of all dairy cows, together with two additional quarterly inspections of all "Grade A" herds, would involve the clinical examination by each of the four assistants of about 30,000 cows per annum.

The sub-committee accordingly recommended that four whole-time assistant veterinary officers be appointed for the Gloucester, Northleach, Chipping Sodbury, and Dursley districts; and that the salary of each assistant officer should be £450 per annum, together with travelling allowances in accordance with the county scale; that the posts should be designated for the purposes of superannuation, that an annual allowance of £10 be made to each assistant officer for the establishment and maintenance of laboratories; and that the 14 part-time inspectors now acting be retained for the time being for the performance of the duties above specified.

The Chairman of the sub-committee said he was sure the importance of the work performed by the veterinary officers from both the point of view of the milk-consuming public and that of the milk producers, would be appreciated. The position was necessarily a difficult one because there was not merely dual or triple control, but multiple control, and it was essential that there should be whole-hearted co-operation among the committee and its officers, and the officers of the district councils.

The report was approved.

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DISEASES OF ANIMALS (IMPORTATION OF THERAPEUTIC SUBSTANCES) ORDER OF 1936

In pursuance of the powers conferred by Part II of the Diseases of Animals Act of 1935 the Ministry of Agriculture and Fisheries has issued an Order entitled the Diseases of Animals (Importation of Therapeutic Substances) Order of 1936. This Order, which will come into operation on July 1st, 1936, requires the labelling with a clear description of its contents of every container imported into Great Britain containing any of the therapeutic substances to which Part II of the Diseases of Animals Act of 1935 applies, and with an indication of the place and country in which it was prepared.

These substances are (*a*) those commonly known as vaccines, sera, toxins, antitoxins and antigens; (*b*) the substance commonly known as salvarsan (Dioxy-diamino-arseno-benzol-di-hydrochloride) and analogous substances used for the specific treatment of infective disease; and (*c*) extract of the pituitary body.

The Therapeutic Substances Act of 1925 (the purpose of which is to regulate the manufacture for sale, and the importation, of therapeutic substances intended for use in human medicine) exempts such substances from the operation of that Act if labelled as being intended to be used solely for veterinary purposes, but the new Order

made under the Diseases of Animals Act, 1925, prescribes that in addition the label attached to imported veterinary therapeutic substances must include a full description of the contents and an indication of the place of origin.

The Order also prohibits the landing in Great Britain of contagious abortion vaccine, live or dead, unless its landing is authorised by a licence granted by the Ministry, and subject to such conditions as may be inserted therein. The issue of licences for the importation of contagious abortion vaccine from abroad (including the whole of Ireland, the Channel Islands and the Isle of Man) will be limited to dead vaccine. This does not mean that the use of live vaccine in this country will necessarily be prohibited, but that after the date of operation of this Order live vaccine used in Great Britain must be prepared in this country.

Copies of the Order can be obtained from the Ministry's Offices, at 7, Whitehall Place, London, S.W.1.

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THE THIRD INTERNATIONAL CONGRESS OF COMPARATIVE PATHOLOGY

Visit of British Veterinarians to Athens

The Third International Congress of Comparative Pathology was held at Athens from the 15th to 18th April inclusive. The opening ceremony was held in the Houses of Parliament at Athens, where the delegates were received in person by the King of the Hellenes, the head of the Greek Orthodox Church and the Ministers of State. The British veterinary profession was represented by Professor F. C. Minett, of London, and Professor Russell Greig, of Edinburgh.

The Congress was divided into three sections, comprising Human Pathology, Animal Pathology and Plant Pathology respectively. The veterinary section was principally concerned with the consideration of echinococcosis, spirochaetosis, and anaerobic infections, leishmaniasis and animal variola.

The subject of braxy-like diseases was considered under "Anaerobic Infections," and was of particular interest to the British representatives, who took part in the discussion. Professor Nils Dungal, of the University of Reykjavik, Iceland, explained the method of braxy vaccination employed in Iceland, and the results which had been obtained, and Professor Greig presented the results of the braxy prophylactic vaccine which was used in Scotland. In both cases the vaccine was prepared from a *Vibrion septique* formalinised whole culture, and the results were closely comparable in that in each case the incidence of the disease had been reduced to a figure below one per cent.

There is a very excellent State Veterinary Service in Greece. No veterinary teaching institution exists in the country, the Greek veterinarians being trained principally at Cureghem-Brussels and at Alfort.

Agriculture in Greece consists mostly in peasant farming and, in some areas, is carried on under somewhat primitive conditions. The principal livestock of the country consists of sheep, which number approximately seven million, while there are also four-and-a-half million goats. It has recently been recognised that the losses sustained by the State from disease in these animals are heavy, and a Veterinary Research Institute is established at Athens under the directorship of Dr. Melanidi, whose chief of staff is Dr. Debonera. It was found that the work of the Moredun Institute, Edinburgh, had been closely followed.

Lamb dysentery is widely distributed and a lamb dysentery vaccine and serum have been prepared and applied throughout the last two years. A braxy-like disease closely comparable to "struck" on the Romney Marsh is also prevalent and has been found to be due to *B. paludis* (McEwen). Fifty thousand doses of a preventive vaccine have been issued by the Institute, but the efficacy of the product is yet to be ascertained. It was found, too, that milk fever was prevalent in the dairy herds which are situated principally in the environs of large towns, and that the method of calcium therapy is generally practised.

The Institute also issues prophylactic vaccines against anthrax, which is one of the main problems in epizootic disease, and other prophylactic vaccines are prepared for goat-pox, blackquarter, fowl cholera, fowl typhoid, fowl diphtheria, and contagious agalactia in cows.

The general impression left in the mind of the British representatives was that the Greek veterinary profession is a body of enthusiastic workers, keenly alive to the importance of veterinary science in regard to State service, public health and general practice in their country.

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THE HYGIENIC CONTROL OF MILK

At the present time, when public interest in nutrition is widespread, and milk is being lauded as the ideal food, it has been considered opportune to review the present status of milk hygiene and control in the *British Medical Journal*. "The reports published in the January number of the bulletin issued by the Office International d'Hygiène Publique at Paris deal with the milk situation in Great Britain and Ireland, France, the United States, and Canada. Taken as a whole these reports draw a depressing picture. It would indeed require the genius of Mr. H. G. Wells to bring out to the full the almost tragic failure of co-ordination, the wasted effort, the human frailty, and the self-centred individualism that mark the production and distribution of this most necessary article of human nutrition. Such a pen would also be needed to give an adequate outline of the long fight of the public health services against the forces of ignorance, prejudice, and economic interest in the struggle to provide the public with a clean, safe milk. M. Thieulin, describing the deplorable conditions prevailing in France, puts his finger on one of the most important difficulties in the way of progress—namely, public ignorance and apathy. Milk to the public is just 'milk,' and until the man in the street realises the differences in cleanliness and safety between various grades it will be impossible to provide any adequate stimulus to producers and distributors for increasing the supply of high-quality milk. The same lesson is preached in the report of the Medical Research Council for the year 1934-5. 'In general, any curative form of therapy can be readily adopted by practising doctors, whereas discoveries in preventive medicine stand in another category and usually require great public interest and legislation before they can become effective, especially when they touch, as they usually do, the economic interests of the country.' Sooner or later the public will have to be told the real truth about milk. Not until it realises this will there be an effective demand for a complete reorganisation of our present system of supply and control. There are, however, a few bright splashes in the picture. Pasteurisation is undoubtedly making headway, and the voluntary decision of the Certified Milk

Producers of America last June to permit of the pasteurisation of certified milk must be regarded as a milestone in the progress towards a high-quality safe milk supply. Against this must be put the 42 milk-borne epidemics occurring in the United States during the year 1934. The progressive adoption of the Federal Milk Ordinance and Code will be greeted with satisfaction by those who are acquainted with its well-conceived plan, and it is particularly gratifying to learn that Chicago, which has the remarkable history of excluding at a single legislative stroke the admission to the city of all milk from non-tuberculin-tested herds, has now decided to adopt the Federal Code. A further index of progress is afforded by the introduction of a scheme for the gradual eradication of contagious abortion in the United States. In this country we may perhaps take heart from our colleagues on the other side of the Atlantic, whose faith has never wavered in their determination to provide the public with a milk free from the risk of causing disease and death."

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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ROYAL VETERINARY COLLEGE: SIR FREDERICK HOBDAY'S IMPENDING RETIREMENT

To the Editor of the Veterinary Record

Sir,—The news published in the *Veterinary Record* of May 16th, regarding Sir Frederick Hobday will come, I cannot help but feel, as a complete surprise to members of the profession. It is well known that but for the efforts of the present Principal there would have been no new College, and surely the graceful thing would have been for the Governors to have waived the age limit and for Sir Frederick to have remained in complete charge at least until the buildings were completed.

The statement in the editorial article of the *Veterinary Record* of May 16th that the Governors would be faced with a great difficulty in finding a successor to Sir Frederick Hobday is susceptible of misinterpretation. I, personally, see no reason why they should experience any such difficulty. Surely there are worthy men on the teaching staff of the College who are not only capable of filling the appointment satisfactorily but who are deserving of promotion.

It is perhaps opportune for me to point out that the profession is at the moment subscribing to the Hobday Portrait Fund, therefore I shall be grateful if members who have not already subscribed and who wish to do so will send their cheques along to Major Hamilton Kirk, 658, Finchley Road, London, N.W.11.

Yours faithfully,
H. S. A. Dunn.

10, Walsingham Road,
Hove, 3,
Sussex.

The Editor acknowledges, with thanks, the receipt of the following:—

Communications from Mr. E. G. Conisbee (Axminster), Major W. S. Stevens and Professor J. G. Wright (London).

Report of the annual meeting of the West of Scotland Division, N.V.M.A., from Mr. Alex. Thomson, Hon. Secretary.

Diseases of Animals Acts

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th May, 1936	15	16	—	—	2	5	5	94	71
Corresponding period in									
1935	14	15	2	1,242	3	5	5	85	54
1934	16	19	1	62	3	4	4	65	38
1933	13	13	—	—	4	4	9	114	70
Total 1st January to 15th May, 1936	213	255	4	379	64	196	131	840	555
Corresponding period in									
1935	167	183	32	10,111	62	93	176	663	315
1934	185	195	2	93	78	126	315	583	324
1933	143	163	54	5,161	89	162	188	544	266

Note.—The figures for the current year are approximate only.

§ Excluding outbreaks in Army Horses.

N.V.M.A. Congress at Scarborough, September 14th-18th, 1936

PROVISIONAL PROGRAMME

The following is the Provisional Programme of the Association's Congress, to be held at Scarborough from September 14th to September 18th, 1936:—

SUNDAY, SEPTEMBER 13TH—

8 p.m.—Informal "At Home" (Place to be selected).

MONDAY, SEPTEMBER 14TH—

10 a.m.—Civic Welcome by the Mayor of Scarborough (Public Library).
10.30 a.m.—Opening of Exhibition of Surgical Instruments, Drugs, etc., by the President. (Harrison Room, Public Library).
11 a.m.—Paper: "Hysteria in Dogs," by Mr. H. R. Hewetson, M.R.C.V.S. Discussion to be opened by Major F. Chambers, *O.B.E.*, F.R.C.V.S. (Public Library).
7.30-11 p.m.—Civic Reception and Dance (Royal Hotel).

TUESDAY, SEPTEMBER 15TH—

10 a.m.—Paper: "Abortion in Ewes," by Professor J. Russell Greig, PH.D., M.R.C.V.S. Discussion to be opened by Captain T. J. Bosworth, B.SC., M.R.C.V.S., D.V.S.M. (Public Library).
11 a.m.—Paper: "A Consideration of the Accredited Producers' Scheme of the Milk Marketing Board," by Major D. S. Rabagliati, *O.B.E.*, B.Sc., F.R.C.V.S., D.V.S.M. Discussion to be opened by Mr. H. W. Steele Bodger, M.R.C.V.S. (Public Library).
3 p.m.—Operations and Demonstrations (Corporation Stables).
8 p.m.—President's Reception (Royal Hotel).

WEDNESDAY, SEPTEMBER 16TH—

10 a.m.—Paper: "The Detection of the Tuberculous Cow," by Captain H. L. Torrance, M.R.C.V.S., D.V.S.M. Discussion to be opened by Mr. J. S. Steward, F.R.C.V.S., D.V.S.M. (Public Library).
11.30 a.m.—Paper: "Some Observations on the Use of Vaccines in the Protection of Cattle against Tuberculosis," by Professor J. B. Buxton, M.A., F.R.C.V.S., D.V.H. Discussion to be opened by Mr. H. G. Lamont, M.SC., M.R.C.V.S. (Public Library).
2.30 p.m.—Council Meeting (Public Library).
3.30 p.m.—Annual General Meeting (Public Library).
7 p.m. for 7.30 p.m.—Annual Banquet (Royal Hotel).

THURSDAY, SEPTEMBER 17TH—

10.30 p.m.—Address and Demonstration on "Sterility in Bulls," by Professor Nils Lagerlöf of Stockholm (Public Library).
2 p.m.—Excursions.
8 p.m.—Dance in aid of the Ladies' Benevolent Guild (Royal Hotel).

FRIDAY, SEPTEMBER 18TH—

10 a.m.—Paper: "A General Consideration of the Disease Conditions mentioned in the Horse Breeding Acts," by Professor W. M. Mitchell, *M.C.*, M.B., CH.B., B.SC., M.R.C.V.S. Discussion to be opened by Major Brennan DeVine, *M.C.*, F.R.C.V.S., D.V.S.M., F.R.SAN.I. (Public Library).
3 p.m.—Closing Meeting (Public Library).

Schedule of Accommodation at Hotels and Boarding Houses

Name and situation of hotel or boarding-house.	Charges for bed and breakfast.		Weekly charges for bed and breakfast.		Inclusive charges.				Whether garage at hotel—if not, situation of nearest garage.	Available bedroom accommodation.	
					Per day.		Per week.				
	Single room.	Double room.	Single room.	Double room.	Single room.	Double room.	Single room.	Double room.		Single rooms.	Double rooms.
Parade Private Hotel, Esplanade	6/6	12/-					3½ gns.	7 gns.	No. Nearest 1 minute away	7	8
Spa Private Hotel, St. Nicholas' Cliff	6/6	13/-			10/-	20/-	3 gns.	6 gns.	No. Nearest 100 yds. away	20	40
Prince of Wales Boarding House, 28, Prince of Wales Ter.	6/6	13/-					3½ gns.	£7	No. Nearest at back of hotel	10	20
Grosvenor Private Hotel, South Cliff			50/-	4 gns.			3½ gns.	6 gns.	Yes — for 11 cars. Nearest garage 3 mins. away	14	54
"Breece," West St., South Cliff	7/-	12/- 14/- twin beds					3½ gns.	133/- 3½ gns. each, twin beds	No. Nearest 200 yards away	10	25 (9 with twin beds)
"Rivelyn" Private Hotel, Crown Crescent, South Cliff	7/-	12/-			11/6	21/-			Yes — for 6 cars	6	14
Sefton Private Hotel, Prince of Wales Terrace, South Cliff	7/6	15/-			10/6 to 11/6	21/- to 23/-			No. Nearest a few yards away	3	33
										Passenger lift to all bedrooms	
Fairview Hotel, South Cliff	7/6	13/-	52/6	91/-	11/- to 13/-	20/- to 25/-			Yes—2 lock-up garages & very large garage 150 yds. away	21	35
Denisholme Private Hotel, South Cliff	7/6	12/6					4 gns.	7 gns. to 8 gns.	No. 3 garages near	2	9
Clifton Hotel, North Bay	7/6	14/-					4 gns.	£8	No. Garage adjoins hotel	20	40
Zylpha Hotel, South Cliff	7/6	14/-					3½ gns.	6 gns.	Yes — a small one—a very large garage opposite	50	40
"Carisbrooke" Central Private Hotel, The Crescent	7/6	13/-					3½ gns.	7 gns.	Own car park	10	24
St. Nicholas' Private Hotel	7/6 to 8/6	15/- to 17/-			21/- to 25/-	21/- to 25/-			No. Nearest 100yds. away	45	50
Rowntree's Villa Esplanade, South Cliff	8/-	15/-	55/-	5 gns.					No. Nearest 2 mins. away	15	30
Silverdale Private Hotel, Esplanade	8/-	16/-					4 gns.	7 gns. to 10 gns.	No. Nearest at back of hotel	6	14
Hotel Montrosa, South Cliff.	8/6	17/-					From 87/6	From 8 gns.	No. Three within 150 yards	6	14
Allfield Private Hotel, Prince of Wales Gardens, South Cliff	8/6	17/-			12/6 to 15/-	25/- to 30/-			No. Nearest 1 min. away	4	16
Wessex Private Hotel, Esplanade, Sth. Cliff	8/6	17/-					From 4 gns.	From 8 gns.	No. Nearest 1 min. away	20	26
Esplanade Private Hotel, South Cliff	From 8/6	From 17/-					From 4 gns.	From 8 gns.	Largest garage in Scarborough, within 100 yds. of entrance	20	60

Name and situation of hotel or boarding-house.	Charges for bed and breakfast.		Weekly charges for bed and breakfast.		Inclusive charges.				Whether garage at hotel —if not, situation of nearest garage.	Available bedroom accommodation.	
					Per day.		Per week.				
	Single room.	Double room.	Single room.	Double room.	Single room.	Double room.	Single room.	Double room.		Single rooms.	Double rooms.
St. Alma Private Hotel, West Street, South Cliff	8/6	17/-			10/6	21/-	3 gns.	6 gns.	Yes — public garages also next door	8	30
Weston Private Hotel, Esplanade, Sth. Cliff	8/6	17/-			12/6	25/-			No. Garage accommodation within 3 mins. of hotel	4	16
Brooklands Hotel, South Cliff	8/6	17/-			10/6	21/-			No. Public garage at rear of hotel	21	30
Argyll Private Hotel, Esplanade, Sth. Cliff	8/6	17/-					87/6	£8 15s. to gns.	No. Nearest 1 min. away	2	12
Grand Hotel	8/6 to 10/6	17/- to 21/-			16/- to 25/-	32/- to 50/-			No. Nearest 2 mins. away	100	200
Hazeldene Private Hotel, 48, Esplanade, South Cliff					From 10/6	From 21/-			No. Public garage 3 mins. away	2	15
Waldorf Hotel, Esplanade					From 10/- to 13/6	From 20/- to 27/-	70/- to 94/6	£7 to 9 gns.	No. Nearest 2 min.'s walk from hotel	10	20
Prince of Wales Hotel	10/6	21/- 25/- private bath					7 gns.	14 gns.	No. Nearest 1 minute from hotel	70	50
Cambridge Hotel, South Cliff	10/6	21/-							Yes, for 4 cars Lock-up gar. 2/- per night Several near	15	30
Holbeck Hall Hotel, Seacliffe Road	10/6	21/-					From 5 gns. to 7 gns.	From 10 gns. to 14 gns.	Yes	16	16
Pavilion Hotel	From 10/6	From 21/-					From 5 gns. to 9 gns.	From 10 gns. to 18 gns.	Yes	50	50
Royal Hotel	10/6	21/-					From 5 gns. to 8 gns.	From 10 gns. to 16 gns.	No. 3 public garages in close proximity	100	95
Uplands Private Hotel, Prince of Wales Terrace, South Cliff					10/6 to 14/-	21/- to 28/-			No. Good garage within 100 yds.	8	16
Hotel Granville, Esplanade	12/- to 16/6	24/- to 33/-							No. Public garage at rear of hotel	18	30
Manor Private Hotel					12/- to 15/-	24/- to 30/-			No. Nearest 150 yards from hotel		
Ramsdale Private Hotel, South Cliff							5 gns. and £5 15s.	10 gns. and £11 10s.	Yes	11	18
Red Lea	14/- to 18/-	28/- to 36/-							No. Nearest 3 mins from hotel		
Queen's Hotel					14/- to 21/-	28/- to 42/-			No. Outside parking for 40 cars in hotel grounds	38	50
Crown Hotel	14/6	29/-			21/6 to 25/6	43/- to 51/-			No. Public garage directly at rear of hotel	20	20

The positions of the above-mentioned hotels can be ascertained from a map published in the Scarborough Handbook, copies of which can be obtained post free from the Publicity Manager, Town Hall, Scarborough.

AS THE PERIOD OF THE CONGRESS COMES WITHIN THE "BUSY SEASON," EARLY BOOKING OF ACCOMMODATION IS ESSENTIAL.